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THE
ZOOLOGICAL RECORD

FOR 1871;

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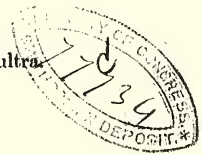
RECORD OF ZOOLOGICAL LITERATURE.

EDITED BY

ALFRED NEWTON, M.A., F.R.S.,

PROFESSOR OF ZOOLOGY AND COMPARATIVE ANATOMY IN THE UNIVERSITY
OF CAMBRIDGE, F.L.S., V.P.Z.S., ETC.

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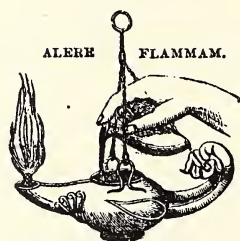


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P R E F A C E.

THE publication of this volume has been delayed by the unlucky indisposition of one of the Recorders, a circumstance which has caused its EDITOR the greatest annoyance. He has, however, to return his hearty thanks to Mr. KIRBY, who most kindly volunteered, at short notice, to meet the unexpected difficulty by undertaking the portions treating of *Vermes* and *Echinodermata*, being assisted by Prof. TRAQUAIR in those relating to *Cœlenterata* and *Protozoa*.

It must also be stated that Mr. DRESSER was compelled by various occupations to withhold the aid he would otherwise have gladly given to the article on *Aves*, and that Mr. LANKESTER, through illness, had to abandon his intention of contributing to the present volume.

The British Association for the Advancement of Science and the Council of the Zoological Society of London have again assisted the ZOOLOGICAL RECORD ASSOCIATION—the former by voting £100, and the latter £58 11s. 10d. (being the interest of the Davis Bequest) towards the expenses of the volume for 1872.

Mr. E. C. RYE has succeeded Mr. CROTCH as Subeditor of

the work; and THE EDITOR is confident that he could not have met with a more able, a more painstaking, or a more willing assistant. To that gentleman and to the other Recorders he begs leave to offer his thanks for the readiness with which they have acquiesced in most of his suggestions.

A. N.

Magdalene College, Cambridge,
May, 1873.

*** Communications, papers, and memoirs intended for this work should be addressed *solely* to "THE EDITOR of the Zoological Record, care of Mr. Van Voorst, 1 Paternoster Row, London." It is earnestly requested that in the case of separately-printed copies of papers so forwarded the *original pagination* be indicated.

LIST OF THE
PRINCIPAL ABBREVIATED TITLES OF JOURNALS
QUOTED IN THIS VOLUME.

- Abh. böhm. Ges.*—Abhandlungen der k. böhmischen Gesellschaft der Wissenschaften.
- Abh. Ges. Halle.*—Abhandlungen der naturforschenden Gesellschaft zu Halle.
- Act. Lund.*—Acta Universitatis Lundensis.
- Act. Soc. L. Bord.*—Actes de la Société Linnéenne de Bordeaux.
- Am. J. Conch.*—American Journal of Conchology.
- Am. J. Sc.*—American Journal of Science and Arts.
- Am. Nat.*—American Naturalist.
- Ann. Ent. Belg.*—Annales de la Société entomologique de Belgique.
- Ann. Lyc. N. York.*—Annals of the Lyceum of Natural History of New York.
- Ann. Mal. Belg.*—Annales de la Société malacologique de Belgique.
- Ann. N. H. (4).*—Annals and Magazine of Natural History. Fourth Series.
- Ann. Sc. Nat. (5).*—Annales des Sciences Naturelles. 5me Série.
- Ann. Soc. Agric. Lyon (4).*—Annales de la Société d'Agriculture, Histoire naturelle et arts utiles de Lyon. 4me Série.
- Ann. Soc. Ent. Fr.*—Annales de la Société entomologique de France.
- Ann. Soc. L. Lyon.*—Annales de la Société Linnéenne de Lyon.
- Ann. Soc. L. Maine-et-Loire.*—Annales de la Société Linnéenne du département de Maine-et-Loire.
- Arch. Anat. Phys.*—Archiv für Anatomie, Physiologie, und wissenschaftliche Medicin.
- Arch. f. Nat.*—Archiv für Naturgeschichte.
- Arch. Landesdurchf. Böhm.*—Archiv für die naturwissenschaftliche Landesdurchforschung von Böhmen.
- Arch. mikr. Anat.*—Archiv für mikroskopische Anatomie.
- Arch. Néerl.*—Archives Néerlandaises des Sciences exactes et naturelles.
- Arch. sci. nat.*—Archives des Sciences physiques et naturelles (Bibliothèque Universelle et Revue Suisse).
- Arch. Tr. Orl. Co. Soc.*—Archives of Science and Transactions of the Orleans County Society of Natural Sciences.
- Arch. Ver. Mecklenb.*—Archiv des Vereins der Freunde der Naturgeschichte in Mecklenburg.
- Arch. Z. Par.*—Archives de Zoologie expérimentale et générale.
- Atti Acc. Gioen.*—Atti dell' Accademia Gioenia di scienze naturali.

- Atti Acc. Tor.*—Atti della R. Accademia delle scienze di Torino.
- Atti Ist. Nap.*—Atti del R. Istituto d'incoraggiamento alle scienze naturali di Napoli.
- Atti Ist. Venet.*—Atti del Istituto Veneto di scienze &c.
- Atti Soc. Ital.*—Atti della Società Italiana di scienze naturali.
- Ber. Ges. Bamb.*—Bericht der naturforschenden Gesellschaft in Bamberg.
- Ber. offenb. Ver.*—Bericht über die Thätigkeit des offenbacher Vereins für Naturkunde.
- Ber. senck. Ges.*—Bericht der senckenbergischen naturforschenden Gesellschaft.
- Ber. Ver. Augsb.*—Bericht des naturhistorischen Vereins in Augsburg.
- Ber. Vers. deutsch. Orn.-Ges.*—Bericht über die Versammlung der deutschen Ornithologen-Gesellschaft.
- B. E. Z.*—Berliner entomologische Zeitschrift.
- Bibl. Univ.*—Archives des Sciences physiques et naturelles (Bibliothèque Universelle et Revue Suisse).
- Bull. Ac. Belg.*—Bulletin de l'Académie Royale des Sciences de Belgique.
- Bull. Ent. Ital.*—Bullettino della Società Entomologica Italiana.
- Bull. Ess. Inst.*—Bulletin of the Essex Institute.
- Bull. malac.*—Bullettino malacologico Italiano.
- Bull. Mosc.*—Bulletin de la Société impériale des Naturalistes de Moscou.
- Bull. Mus. C. Z.*—Bulletin of the Museum of Comparative Zoölogy of Boston.
- Bull. Pétersb.*—Bulletin de la classe physico-mathématique de l'Académie impériale des Sciences.
- Bull. Soc. Acclim.*—Bulletin de la Société d'Acclimation.
- Bull. Soc. Neuch.*—Bulletin de la Société des Sciences Naturelles de Neuchâtel.
- Bull. Soc. Vaud.*—Bulletin de la Société Vaudoise des Sciences Naturelles.
- Canad. Ent.*—The Canadian Entomologist.
- Canad. Nat.*—The Canadian Naturalist and Geologist.
- CB. Ver. Regensb.*—Correspondenz-Blatt des zoologisch-mineralogischen Vereins in Regensburg.
- C. H.*—Coleopterologische Hefte.
- C. R.*—Comptes Rendus de l'Académie des Sciences.
- Ent.*—The Entomologist.
- Ent. Ann.*—The Entomologist's Annual.
- Ent. Blätt.*—Entomologische Blätter aus der Schweiz.
- Ent. M. M.*—Entomologist's Monthly Magazine.
- Erinn. Vers. deutsch. Orn.*—Erinnerungsschrift an die Versammlung der deutschen Ornithologen.
- Feuil. Nat.*—Feuilles des jeunes Naturalistes.
- Forh. Selsk. Chr.*—Forhandlinger i Videnskabs-Selskabet i Christiania.
- Gard. Chron.*—The Gardener's Chronicle.

- J. Anat. Phys.*—Journal of Anatomy and Physiology.
J. A. S. B.—Journal of the Asiatic Society of Bengal.
JB. Gen. Amst.—Jaarboek van het k. zoologisch Genootschap "Natura Artis Magistra."
JB. Ges. Hannov.—Jahresbericht der naturforschenden Gesellschaft in Hannover.
JB. Mus. Kärnt.—Jahrbuch des naturhistorischen Landesmuseums von Kärnthen.
JB. schles. Ges.—Jahresbericht der schlesischen Gesellschaft für vaterländische Cultur.
JB. wien. Kom.-Oberrealsch.—Jahresbericht der wiener Kommunal-Oberrealschule in der Rossau.
J. de Conch.—Journal de Conchyliologie.
J. de l'Anat. Phys.—Journal de l'anatomie et de la physiologie.
Jen. Z. Nat.—Jenaische Zeitschrift für Medicin und Naturwissenschaft.
J. f. O.—Journal für Ornithologie.
J. G. Soc.—Quarterly Journal of the Geological Society.
JH. Ver. Lüneb.—Jahreshefte des naturwissenschaftlichen Vereins in Lüneburg.
JH. Ver. Württ.—Jahreshefte des Vereins für vaterländische Naturkunde in Württemberg.
J. L. S.—Journal of the Linnean Society.
J. Quek. Micr. Club.—Journal of the Quekett Microscopical Club.
J. R. Dubl. Soc.—Journal of the Royal Dublin Society.
J. Sc. Lisb.—Jornal de Sciencias da Academia Real de Lisboa.
J. Travel & N. H.—Journal of Travel and Natural History.
J. Zool.—Journal de Zoologie.
- L'Ab.*—L'Abeille.
- Madr. J. Sc.*—Madras Journal of Literature and Science.
Mal. Bl.—Malakozologische Blätter.
MB. Ak. Berl.—Monatsberichte der k. Akademie der Wissenschaften zu Berlin.
Mem. Ac. Bologn.—Memorie dell' Accademia di scienze dell' Istituto di Bologna.
Mém. Ac. Lyon.—Mémoires de l'Académie des Sciences &c. de Lyon.
Mem. Acc. Tor.—Memorie della R. Accademia delle Scienze di Torino.
Mém. Ac. Toulouse.—Mémoires de l'Académie des sciences &c. de Toulouse.
Mem. Am. Ac.—Memoirs of the American Academy of Arts and Sciences.
Mem. Bost. Soc.—Memoirs of the Boston Society of Natural History.
Mem. Peab. Ac.—Memoirs of the Peabody Academy of Arts and Sciences.
Mém. Pétersb.—Mémoires de l'Académie impériale des Sciences de St.-Pétersbourg.
Mém. Soc. Cherb. (2).—Mémoires de la Société des sciences naturelles de Cherbourg. 2me Série.
Mém. Soc. L. Norm.—Mémoires de la Société Linnéenne de Normandie.
Mém. Soc. Phys. Genève.—Mémoires de la Société de physique et d'histoire naturelle de Genève.
M. Micr. J.—The Monthly Microscopical Journal.
MT. Ges. Bern.—Mittheilungen der naturforschenden Gesellschaft in Bern.

- MT. schw. ent. Ges.*—Mittheilungen der schweizerischen entomologischen Gesellschaft.
- MT. Vorpomm.*—Mittheilungen aus dem naturwissenschaftlichen Vereine von Neu-Vorpommern und Rügen.
- Nachr. Ges. Götting.*—Nachrichten von der k. Gesellschaft der Wissenschaften zu Göttingen.
- Nachr. Ges. Mosc.*—Nachrichten der k. Gesellschaft der Liebhaber der Naturkunde zu Moskau.
- N. Act. Ups.*—Nova Acta R. Societatis scientiarum Upsaliensis.
- N. Arch. Mus.*—Nouvelles Archives du Muséum d'Histoire Naturelle.
- Nat. Mex.*—La Naturaleza.
- N. Mag. Naturv.*—Nyt Magazin for Naturvidenskaberne.
- Nied. Arch. Zool.*—Niederländisches Archiv für Zoologie.
- Not. Fenn.*—Notiser ur Sällskapets pro Fauna et Flora Fennica Förhandlingar.
- Nouv. et Faits.*—Nouvelles et Faits divers.
- N. T. D.*—Nederlandsch Tijdschrift voor de Dierkunde.
- Nunq. Ot.*—Nunquam Otiosus.
- Œfv. Sv. Ak. (and Œfv. Vet. Ak.).*—Œfversigt af K. Vetenskaps Akademiens Förhandlingar.
- Op. Ent.*—Opuscles Entomologiques.
- Overs. Dan. Selsk.*—Oversigt over det K. Danske Videnskabernes Selskabs Forhandling og dets Medlemmers Arbeider.
- P. Ac. Philad.*—Proceedings of the Academy of Natural Sciences of Philadelphia.
- P. Am. Phil. Soc.*—Proceedings of the American Philosophical Society.
- P. A. S. B.*—Proceedings of the Asiatic Society of Bengal.
- P. Bost. Soc.*—Proceedings of the Boston Society of Natural History.
- P. Dubl. Soc.*—Proceedings of the Dublin Natural-History Society.
- P. Ess. Inst.*—Proceedings and Communications of the Essex Institute.
- Pet. Nouv.*—Petites Nouvelles Entomologiques.
- P. Geol. Ass.*—Proceedings of the Geologists' Association.
- Pharm. J. & Tr. (3).*—Pharmaceutical Journal and Transactions. 3rd Series.
- P. Hexh. Club.*—Proceedings of the Hexham Farmers' Club.
- Phil. Tr.*—Philosophical Transactions of the Royal Society.
- P. L. S.*—Proceedings of the Linnean Society.
- P. N. H. Soc. Glasg.*—Proceedings of the Natural-History Society of Glasgow.
- Pop. Sc. Rev.*—The Popular Science Review.
- P. R. Irish Ac.*—Proceedings of the Royal Irish Academy.
- P. R. Soc.*—Proceedings of the Royal Society.
- P. R. Soc. Edinb.*—Proceedings of the Royal Society of Edinburgh.
- P. R. Soc. Maur.*—Proceedings of the Royal Society of Arts and Sciences of Mauritius.
- P. R. Soc. Tasm.*—Monthly Notices and Proceedings of the Royal Society of Tasmania.
- P. Soc. Birmingh.*—Proceedings of the Natural-History and Microscopical Society of Birmingham.
- Publ. Inst. Luxemb.*—Publications de L'Institut Royal Grand-ducal de Luxembourg, Section des Sciences naturelles et mathématiques.
- P. Z. S.*—Proceedings of the Zoological Society.

- Q. J. Micr. Sc.*.—Quarterly Journal of Microscopical Science.
- Rec. Am. Ent.*.—Record of American Entomology.
- Rend. Acc. Nap.*.—Rendiconti dell' Accademia di scienze fisiche e matematiche di Napoli.
- Rend. Ist. Lomb.*.—Rendiconti del r. Istituto Lombardo di scienze &c.
- Rep. Belf. Club.*.—Annual Report of the Belfast Naturalists' Field Club.
- Rep. Br. Ass.*.—Report of the British Association for the Advancement of Science.
- Rep. Ins. Mo.*.—Annual Report on the noxious, beneficial, and other Insects of the State of Missouri.
- Rep. Peab. Ac.*.—Annual Report of the Trustees of the Peabody Academy.
- Rep. Plym. Inst.*.—Annual Report of the [Plymouth Institution and] Devon and Cornwall Natural-History Society.
- Riv. sci.-ind.*.—Rivista scientifico-industriale.
- R. Z.*.—Revue et Magasin de Zoologie pure et appliquée.
- SB. Ak. Wien.*.—Sitzungsberichte der mathemat. naturwiss. Klasse der k. Akademie der Wissenschaften zu Wien.
- SB. bayer. Ak.*.—Sitzungsberichte der k. bayerischen Akademie der Wissenschaften.
- SB. Ges. Dorp.*.—Sitzungsberichte der Dorpater Naturforscher-Gesellschaft.
- SB. Ges. Isis.*.—Sitzungsberichte der naturwissenschaftlichen Gesellschaft 'Isis.'
- SB. Ges. Marb.*.—Sitzungsberichte der Gesellschaft zur Beförderung der gesammten Naturwissenschaften zu Marburg.
- SB. nat. Fr.*.—Sitzungsberichte der Gesellschaft naturforschender Freunde zu Berlin.
- SB. oberhess. Ges.*.—Sitzungsberichte der oberhessischen Gesellschaft für Natur- und Heilkunde.
- SB. Soc. Erlang.*.—Sitzungsberichte der physikalisch-medicinischen Societät zu Erlangen.
- SB. Ver. Rheinl.*.—Sitzungsberichte des naturhistorischen Vereins der preussischen Rheinlande und Westphalens.
- Sc. Goss.*.—Science Gossip.
- Schr. Ges. Königsb.*.—Schriften der k. physikalisch-ökonomischen Gesellschaft in Preussen.
- Schr. Ges. Marb.*.—Schriften der Gesellschaft zur Beförderung der gesammten Naturwissenschaften zu Marburg.
- Schr. Ver. nat. Wien.*.—Schriften des Vereins zur Verbreitung naturwissenschaftlicher Kenntniss in Wien.
- Scot. Nat.*.—The Scottish Naturalist.
- S. E. Z.*.—Stettiner entomologische Zeitung.
- Sv. Ak. Handl.*.—K. Svenska Vetenskaps Akademiens Handlingar.
- Term. Közl.*.—Természettudományi Közlemények.
- Tids. Fisk.*.—Tidsskrift for Fiskeri.
- Tids. Naturvid.*.—Tidsskrift for populære Fremstillinger af Naturvidenskaberne.
- Tijdschr. Ent.*.—Tijdschrift voor Entomologie.
- Tr. Am. Ent. Soc.*.—Transactions of the American Entomological Society.
- Tr. Conn. Ac.*.—Transactions of the Connecticut Academy of Sciences.
- Tr. Devon. Ass.*.—Report and Transactions of the Devonshire Association for the Advancement of Science.

Tr. Ent. Soc. N. S. W.—Transactions of the Entomological Society of New South Wales.

Tr. E. Soc.—Transactions of the Entomological Society of London.

Tr. L. S.—Transactions of the Linnean Society.

Tr. Malv. Club.—Transactions of the Malvern Field-Club.

Tr. North. Durh.—Natural-History Transactions of Northumberland and Durham.

Tr. Norw. Soc.—Transactions of the Norfolk and Norwich Naturalists' Society.

Tr. N. Z. Inst.—Transactions and Proceedings of the New-Zealand Institute.

Tr. Odont. Soc.—Transactions of the Odontological Society of London.

Tr. R. Soc. Edinb.—Transactions of the Royal Society of Edinburgh.

Tr. Woolh. Club.—Transactions of the Woolhope Naturalists' Field-Club.

Tr. Z. S.—Transactions of the Zoological Society.

Verh. Ak. Amst.—Verhandelingen der k. Akademie van Wetenschappen.

Verh. bot. Ver. Brand.—Verhandlungen des botanischen Vereins für die Provinz Brandenburg.

Verh. Ges. Würz.—Verhandlungen der physikalisch-medicinischen Gesellschaft in Würzburg.

Verh. schw. Ges.—Verhandlungen der schweizerischen naturforschenden Gesellschaft.

Verh. St. Gall. Ges.—Verhandlungen der St. Gallischen naturwissenschaftlichen Gesellschaft.

Verh. Ver. Heidelb.—Verhandlungen des naturhistorisch-medicinischen Vereins in Heidelberg.

Verh. Ver. Karlsr.—Verhandlungen des naturwissenschaftlichen Vereins in Karlsruhe.

Verh. Ver. Rheinl.—Verhandlungen des naturhistorischen Vereins der preussischen Rheinlande und Westphalens.

Verh. z.-b. Wien.—Verhandlungen der zoologisch-botanischen Gesellschaft in Wien.

Vid. Medd.—Videnskabelige Meddelelser fra den Naturhistoriske Forening.

Viert. Ges. Zürich.—Vierteljahrsschrift der naturforschenden Gesellschaft in Zürich.

Wien. landw. Z.—Wiener landwirthschaftliche Zeitschrift.

Württ. JH.—Württembergische naturwissenschaftliche Jahreshefte.

Z. Ges. Erdk.—Zeitschrift der Gesellschaft für Erdkunde.

Z. ges. Naturw.—Zeitschrift für die gesammten Naturwissenschaften.

Zool. Gart.—Der zoologische Garten.

Zool. Rec.—Record of Zoological Literature.

Zool. s. s.—The Zoologist. Second Series.

Z. wiss. Zool.—Zeitschrift für wissenschaftliche Zoologie.

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ERRATA.

- Page 71, line 11 from bottom, omit Identical with *S. rochusseni* &c.
 " 71, " 12 from bottom, dele all inverted commas.
 " 73, " 25, for Gen. read Ges.
 " 184, " 2, for *id.* read Stimpson.
 " 190, " 15 from bottom, for *id.* read Böck.
 " 194, " 11 from bottom, for *id.* read Olsson.
 " 194, bottom line, for ured read figured.
 " 254, line 11, for *Peltes* read *Peltis*.
 " 258, " 16 from bottom, for *Nigidius* read *Nigidius*.
 " 356, bottom line, for RAMUM read RAMANN.
 " 359, line 21, for *byantis* read *hyantis*.
 " 366, " 13, for g. n., read Butler; *cf.*
 " 382, between lines 16 and 17 insert *G. cauliginella*, Schm.: galls caused by this species at the Drachenfels discussed by A. Müller, Ent. M. M. vii. p. 254.
 " 387, line 19, insert and between Htg., and *tremulæ*; and dele , and *cauliginella*, Schm.
 " 463, line 14, for *Labidaster* read *Labidiaster*.

ZOOLOGICAL RECORD

FOR 1871.

MAMMALIA

BY

ALBERT GÜNTHER, M.A., M.D., PH.D., F.R.S.

THE GENERAL SUBJECT.

α. Separate Publications.

DARWIN, C. The Descent of Man, and Selection in relation to Sex. London: 1871. 16mo, vol. i. pp. 423, vol. ii. pp. 475, illustrated by numerous woodcuts.

As is indicated by the title, this work consists of two parts, the second of which comes within the scope of the 'Zoological Record;' and here we have particularly to refer to chapters 17 and 18, in which the secondary sexual characters of Mammals are discussed. The main theory of sexual selection depends upon the fact that there is a struggle among the males for the possession of the females—a struggle carried on either by actual fighting or by rivalry in various charms, as odour, voice, or beauty. Among Mammalia the law of battle appears to prevail throughout; and the greater size, strength, courage, and pugnacity of the male, his special weapons of offence, as well as his special means of defence, have all been acquired or modified through sexual selection. Likewise the odoriferous glands and the ornamentations of the integuments have been developed in the male through the same cause; but whether, in Mammals, the same view can be extended to the voice, is doubtful. The law of the equal transmission of characters to both sexes, as far as 1871. [VOL. VIII.]

B

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colour and other ornaments are concerned, has prevailed far more extensively with Mammals than with Birds; but in regard to weapons, these have often been transmitted either exclusively or in a much higher degree to the males than to the females. Their absence in the female can be accounted for only by the form of inheritance which has prevailed. The contest between the individuals of the same sex, whether peaceful or bloody, has, with the rarest exceptions, been confined to the males; so that these have been modified through sexual selection, either for fighting with each other or for alluring the opposite sex, far more commonly than the females.

A large portion of the animal kingdom is passed in review, as regards sexual differences and the means by which this differentiation has been produced. This part abounds in matter of interest; and we may well believe that it required many years to collect these materials. The account of the sexual differences in Mammals occupies pages 239–315 of the second volume, and is illustrated by numerous excellent woodcuts.

MIVART, ST. G. *On the Genesis of Species.* London: 1871. 16mo, pp. 296, with woodcuts.

With this work before us we must again express our regret that the 'Zoological Record' is not headed by an abstract of the literature of General Zoology; and we refer to this work here only because we have previously treated of similar publications at the same place. We believe it is generally acknowledged that Mr. Mivart has brought forward the most weighty arguments against the views started and developed by Mr. Darwin. Without controverting the doctrine of evolution, he regards natural and sexual selection as quite incompetent to account for specific modification. He maintains that species have been evolved by ordinary natural laws (for the most part unknown), controlled by the subordinate action of natural selection—and that there is and can be absolutely nothing in physical science which forbids us to regard those natural laws as acting with the Divine concurrence, and in obedience to a creative fiat originally imposed on the primæval Cosmos.

ZELEBOR, J. *Reise der österreichischen Fregatte 'Novara' um die Erde. Zoologischer Theil, i. Säugethiere.* Wien: 1869. 4to, pp. 44, with 3 plates.

The author of this part has confined himself to an enumeration of the species collected during the expedition, and to descriptions of three species considered to be new.

MILNE-EDWARDS, H. & A. *Recherches pour servir à l'histoire naturelle des Mammifères.* Paris: 4to.

See Zool. Record, v. p. 3, and vi. p. 2. Four more parts (nos. 6–9, to p. 208) have reached this country, containing the

continuation of the Mammalian Fauna of China. As the plates are issued irregularly, and quite independently of the letterpress of the parts published, we shall be guided, in future, in our references by the text only.

JONES, T. RYMER. General outline of the Organization of the Animal Kingdom, and Manual of Comparative Anatomy. Fourth edition. London: 1871. 8vo.

TROSCHEL, F. H. Handbuch der Zoologie. Siebente Auflage. Berlin: 1871. 8vo, pp. 788.

This handbook is sufficiently well known to require no more than this short notice. Nothing could better prove its usefulness to the student than the fact of this being its seventh edition.

NICHOLSON, H. A. A Manual of Zoology, for the use of Students, with a general introduction on the Principles of Zoology. Edinb. and Lond.: 1870. 8vo.

——. Advanced Text-book of Zoology, for the use of Schools. Edinb. and Lond.: 1870. 8vo.

——. An Introductory Text-book of Zoology, for the use of Junior Classes. Edinb. and Lond.: 1871. 8vo.

NATHUSIUS, H. VON. Wandtafeln für den naturwissenschaftlichen Unterricht mit specieller Berücksichtigung der Landwirthschaft. First series: Viehzucht. Berlin. 30 lithographic plates.

These plates have been prepared for the purpose of serving as illustrations in lectures on zoology, especially with reference to domestic animals. They are 58 centims. high and 78 centims. broad. The first series consists of the following plates:—

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|---------------------------------------|--|
| 1. Arab Horse. | 17. Skull of Horse. |
| 2. English Racehorse. | 18. Vertical section of the same. |
| 3. Heavy Horse. | 19. Skulls of Shorthorn Bulls, profile. |
| 4. Cossack Horse. | 20. The same, posterior views. |
| 5. Milk-Cow. | 21, 22. The same, anterior views. |
| 6. Shorthorn Cow. | 23. Skull of hornless Cow. |
| 7. Mountain Cow. | 24. Parts of the skulls of various breeds of cattle. |
| 8. Bull. | 25, 26. Skulls of various breeds of Sheep. |
| 9. Short-tailed Sheep. | 27. Skulls of Sheep and Goat, for comparison. |
| 10. Southdown Sheep. | 28, 29. Skulls of various breeds of Pigs. |
| 11. Electoral Merino. | 30. Skulls of young animals. |
| 12. Negretti Merino. | |
| 13. Common and Short-eared Pigs. | |
| 14. Long-eared Pig. | |
| 15. Greyhound. | |
| 16. Skulls of various breeds of Dogs. | |

β. Anatomy and Physiology.

CYON, E. Ueber den Nervus depressor beim Pferde. Bull. Acad. Sc. St. Pétersb. xv. 1871, pp. 261–263, with a plate.

FLOWER, W. H. Notes on the first or milk-dentition of the Mammalia. Trans. Odontol. Soc. iii. 1871, pp. 211–232.

In this treatise the author has collected the scanty information we possess at present on the milk-dentition of Mammals, and draws attention to the importance and interest of a closer study of this subject. The hinder milk-teeth are usually more complex than the teeth of which they are the predecessors in the permanent series, and represent functionally, not their immediate successors, but those more posterior permanent teeth which have no direct predecessors. Among Mesozoic Mammals there is scarcely any evidence of a successive dentition. If a succession took place (*Triconodon*, *Triacanthodon*), it was only in that particular tooth to which it is limited in modern Marsupials; and it would appear probable that in the transition from the lower vertebrate to the mammal, by whatever process it took place, the indefinite repetition of the former was lost, and that a monophyodont dentition supervened, while the peculiar definite diphyodont mode of succession is a superadded and special mammalian characteristic.

———. On the composition of the carpus of the Dog. J. Anat. & Physiol. 1871, pp. 62–64, with woodcut.

———. On the connexion of the hyoid arch with the cranium. Rep. Brit. Assoc. (1870) 1871, Trans. pp. 136, 137.

FOOT, A. W. On goitre in animals. P. Dubl. Soc. vi. pp. 24–32.

GALTON, F. Experiments in Pangenesis, by breeding from Rabbits of a pure variety, into whose circulation blood taken from other varieties had previously been largely transfused. Proc. Roy. Soc. 1871, pp. 393–409.

GARNER, R. Comparison of the thoracic and pelvic limbs in Mammalia. Rep. Brit. Assoc. (1870) 1871, Trans. pp. 137–139.

HILGARD, T. C. Numeric relations of the Vertebrate system. Amer. Nat. 1871, v. pp. 559–561.

MIVART, ST. G. On the Vertebrate skeleton. Trans. Linn. Soc. 1871, xxvii. pp. 369–392, pl. 53.

In this paper the author has examined principally the following questions :—

1. What is the best way to seek *à priori* a general view of the axial skeleton, or in what way may the axial skeleton as a whole be most reasonably regarded *à priori*?

2. What is the essential nature of ribs, transverse processes, and sternum?

3. What is the essential nature of branchial arches, and in what relation do they stand to ribs?

4. What is the essential nature, as compared with branchial arches, of the hyoidean arch, mandible, and more anterior structures?

5. What relation exists between chevron bones and other parts of the skeleton?

At the conclusion of this paper, Mr. Mivart examines also the views recently expressed by Prof. Gegenbaur with regard to the appendicular skeleton.

PETTIGREW, J. B. On the physiology of wings, being an analysis of the movements by which flight is produced in the Insect, Bat, and Bird. Trans. R. Soc. Edinb. 1871, xxvi. pp. 321-448, pls. 11-16.

REICHERT, C. B. Beitrag zur feineren Anatomie der Gehör-schnecke beim Menschen und den Säugethieren. Du Bois-R. and Reichert, Arch. f. Anat. 1871, pp. 117-163, pls. 5 & 6.

STRICKER, S., and SANDERSON, B. On a new method of studying the capillary circulation in Mammals. Rep. Brit. Assoc. (1870) 1871, Trans. pp. 142, 143.

γ. Fauna.

Arctic Ocean. LINDEMANN has published, "Eine Geschichte der arktischen Fischerei der deutschen Seestädte, 1620-1868," in Petermann's Mittheil. 1869, no. 26. It contains instructive accounts of the natural history of various Cetaceans, of the Walrus, Seals, and Arctic Bear.

Great Britain. "Mammalia and Reptilia of Norfolk," by T. SOUTHWELL. Tr. Norw. Soc. i. p. 71. Reprinted, Zoologist, 1871, pp. 2751-60. A paper of local interest.

Pomerania. 'Die Wirbelthiere Pommerns,' by T. HOLLAND. Stolp: 1871. 8vo, pp. 119. The author enumerates 59 Mammalia. A work of local interest.

North America. A paper by J. A. ALLEN, entitled "On the Mammals and Winter-Birds of East Florida," fills the third number of vol. ii. of the 'Bulletin of the Museum of Comparative Zoology' (pp. 161-450). The author gives a sketch of the topographical, climatic, and faunal characteristics of East Florida, and enumerates 35 species of Mammalia (pp. 168-185). The

species are not described; but annotations, chiefly on their distribution and variation, are added. Also their synonymy is worked out.

¶ *Northern China.* M. MILNE-EDWARDS has continued his researches into the Mammalian Fauna of China (Recherch. Mammif.), and brought his account as far as the genus *Felis* (p. 206).

India. 'The Highlands of Central India: Notes on their Forests and Wild Tribes, Natural History and Sports,' by J. FORSYTH. London: 1871. 8vo, pp. 472, with map and illustrations. We notice this work on account of the mass of information regarding the habits and distribution of the larger Mammalia inhabiting Central India. This information is all the more valuable as it is based on the personal experience of the author, who was not only a genuine sportsman, but also a keen observer of nature. He gives admirable accounts of the Gaur, the Deer, and Antelopes, Tiger, Panther, &c. We cannot but think that the premature death of the author is a great loss to the service to which he belonged, as well as to science.

¶ *Egypt.* On the Pig and Sheep in ancient Egypt, see two papers by ROULIN, referred to below under *Sus scrofa*, p. 15, and *Ovis aries*, p. 16.

United States. "Notes on the range of some of the Animals in America at the time of the arrival of the White Men," by W. J. HAYS (Amer. Nat. 1871, v. pp. 387-393), contain numerous interesting historical facts.

Peru. "Notes on the Monkeys of Eastern Peru," by EDWARD BARTLETT. P. Z. S. 1871, pp. 217-220.

Patagonia. 'Notes on the Natural History of the Strait of Magellan and West Coast of Patagonia, made during the Voyage of H.M.S. 'Nassau' in the years 1866-69,' by R. O. CUNNINGHAM (Edinburgh: 1871. 8vo, pp. 517), contain numerous observations on the Mammals seen by the author on the coasts of the southernmost parts of South America.

Australia. Mr. Krefft has published a list of 'Australian Vertebrata, Fossil and Recent.' Sydney: 1871. 8vo. He enumerates, on pp. 1-22, some 110 Marsupials, 24 Bats, 1 Dog, 30 Rats and Mice, and some Cetaceans and Seals.

Dr. T. GILL has read a paper before the American Association for the Advancement of Science, published in the Amer. Natur. 1871, v. pp. 526-533, and entitled, "On the characteristics of the primary groups of the class of Mammals." This paper, in which the primary divisions and orders are fully characterized, is submitted in advance of a work now being printed by the Smithsonian Institution, in which will be given the characters, contrasted in dichotomous tables, of all the groups as low as

subfamilies, and lists of the genera, recent and extinct. We must refer the reader to the paper itself for a table in which the primary groups are so arranged that their mutual relations may be readily understood, and which will also serve as a genealogical table for those who accept the doctrine of evolution. The systematic arrangement is as follows:—

I. Subclass MONODELPHIA.

- A. Superorder EDUCABILIA. "Brain with a relatively large cerebrum, behind overlapping much or all of the cerebellum, and in front much or all of the olfactory lobes; corpus callosum (atypically) [*sic*] continued horizontally backwards to or beyond the vertical of the hippocampal sulcus, developing in front a well-defined recurved rostrum."

* EDUCABILIA QUADRIPEDIA [*sic*].

† *Primate series*.

Order: 1. Primates.

† *Feral series*.

Order: 2. Feræ.

† *Ungulate series*.

Orders: 3. Ungulata. 4. Toxodontia. 5. Hyracoidea. 6. Proboscidea.

* EDUCABILIA MUTILATA.

Orders: 7. Sirenia. 8. Cete.

- B. Superorder INEDUCABILIA. "Brain with a relatively small cerebrum, leaving behind much of the cerebellum exposed, and in front much of the olfactory lobes; corpus callosum extending more or less obliquely upwards, and terminating before the vertical of the hippocampal sulcus, with no well-defined rostrum in front."

† *Insectivorous series*.

Orders: 9. Chiroptera. 10. Insectivora.

† *Rodent series*.

Order: 11. Glires.

† *Edentate series*.

Order: 12. Bruta.

II. Subclass DIDELPHIA.

Order: 13. Marsupialia.

III. Subclass ORNITHODELPHIA.

Order: 14. Monotremata.

SIMIIDÆ.

Troglodytes niger. Bischoff describes and figures the brain of a four-year-old specimen. It seems that the development of certain superficial folds is subject to variation according to age and individuals. SB. Bayer. Ak. 1871, pp. 98-105, with 3 plates.—On the muscles and nerves, F. Champneys, J. Anat. & Physiol. 1871, pp. 176-211.—On some points in the myology of the Chimpanzee and others of the Primates, A. Macalister, A. & M. N. II. 1871, vii. pp. 341-351.

Semnopithecus nigripes, sp. n., A. Milne-Edwards, Nouv. Arch. Mus. vi. Bull. p. 7, pl. 1, Cochinchina.

Macacus lasiotus (Gray), founded on an individual with the tail mutilated, *M. cyclopis* (Swinhoe), and *Inuus sancti-johannis* (Swinhoe) are not proved to be specifically distinct, according to Sclater, P. Z. S. 1871, p. 221.

Macacus problematicus (Gray) = *M. assamensis* (M'Cl.). Sclater, *l. c.* p. 222.

✓ *Macacus inornatus* (Gray) = *M. maurus* (F. Cuv.). Sclater, *l. c.*

Macacus brunneus, sp. n., Anderson, P. Z. S. 1871, p. 628, Assam.

Cynocephalus amibis. On the muscles and nerves, F. Champneys, J. Anat. & Physiol. 1871, pp. 176-211.

CEBIDÆ.

Myccetes seniculus and *ursinus*. On their nomenclature, Sclater, P. Z. S. 1871, p. 219.

✓ *Ateles cucullatus* (Gray) figured. Sclater, *l. c.* pl. 14.

Ateles melanochir (Desm.) = *A. ornatus* (Gray) figured. Sclater, *l. c.* p. 226, pl. 15 (with skull).

Ateles bartletti [see Zool. Rec. vii. p. 7]. Its identity with *A. variegatus* confirmed by Sclater, P. Z. S. 1871, pp. 39, 224.—Some further remarks on its nomenclature by Gray, A. & M. N. II. 1871, vii. pp. 18, 163. ✓ Notes by E. Bartlett, who collected specimens of this monkey in Eastern Peru, P. Z. S. 1871, p. 217.

✓ *Ateles ater*. Notes by E. Bartlett, P. Z. S. 1871, p. 218.

✓ *Lagothrix infumatus* (Spix). Notes by E. Bartlett and Sclater, P. Z. S. 1871, p. 219; probably = *L. castelnauii* (Is. Geoffr.).

Cebus lunatus (F. Cuv.) = *C. leucogenys* (Gray) according to Sclater, P. Z. S. 1871, p. 227.

✓ *Pithecia leucocephala* distinct from *P. chrysocephala*. Sclater, *l. c.* p. 227.

Pithecia chiropotes (Humb.) distinct from *P. satanas* (Hoffm.) = *Chiropotes ater* (Gray), according to Sclater, *l. c.* p. 228.

✓ *Midas devillii* (Is. Geoffr.). Notes by Bartlett, P. Z. S. 1871, p. 220, pl. 13.

Midas geoffroyi (Puch.) figured. Sclater, *l. c.* p. 478, pl. 38.

Nyctipithecus oseryi (Is. Geoffr.) = *N. vociferans* (Spix), Sclater, *l. c.* p. 220.

LEMURIDÆ.

A M. A. MILNE-EDWARDS has investigated the embryology of the Lemurs; he found a very peculiar type of placenta, which he denominates "bell placenta" (placenta en cloche), and a unique arrangement of the tunics, departing more from that of Man and Monkeys than from that proper to the Carnivora. After reviewing other characters of the order Quadrumana, he comes to the conclusion that the Monkeys and Lemuroids cannot be left united in the same ordinal division, and proposes to separate the latter as a distinct order, which would form a link between the order of *Simiæ* and that of *Carnivora*. Ann. Sc. Nat. 1871, xv. art. 6. pp. 7; Compt. Rend. 1871, lxxiii. pp. 422-424; translated in A. & M. N. II. 1871, viii. pp. 438-440.

In a course of lectures given at the Muséum d'Histoire Naturelle, and printed in *Revue Scientifique*, 1871, i. no. 10, pp. 222-227, M. MILNE-EDWARDS treats of the same subject, as well as of the characters of the Lemurs generally, their systematic arrangement, specific distinctions, and geographical distribution.

The same view is adopted by P. GERVAIS in a paper entitled "Mémoire sur les formes cérébrales propres à l'ordre des Lémures, accompagné de remarques sur la classification de ces animaux." *Journal de Zoologie*, i. 1872, pp. 5-27.

Lichanotus mitratus, sp. n., Peters, Berlin. *Monatsb.* 1871, p. 360, Madagascar.

Propithecus diadema and *P. coquerelli* are specifically identical according to Giebel; the latter is probably the female of the former. *Z. ges. Ntrw.* 1871, iii. p. 451.

Propithecus edwardsi and *Propithecus candidus*, spp. nn., Grandidier, *Compt. Rend.* 1871, lxxii. pp. 231, 232, Madagascar.

Lemur. Mr. Sclater remarks on the synonymy of some of the species, particularly from observations upon specimens living in the Zoological Society's menagerie (P. Z. S. 1871):—

1. *Lemur macaco*, which Schlegel justly distinguished from *L. varius* (Geoffr.), p. 229.

2. *Lemur xanthomystax* (Gray), p. 230.

3. *Lemur mongoz* (Van d. Hoëv.) or *L. collaris* (Geoffr.) is the male, and *L. nigrifrons* (Geoffr., not F. Cuv.) or *L. dubius* (F. Cuv.) the female of the same species, p. 231, pl. 16.

4. *Lemur brunneus* (Van d. Hoëv.) probably = *Prosimia melanocephala* (Gray), p. 231.

5. *Lemur flavifrons* (Gray), p. 232.

Lemur ruber. Notes on the coloration by Dr. Gray, P. Z. S. 1871, p. 297.

Lemur macaco (L.). On its variations, Gray, A. & M. N. II. 1871, vii. p. 339.

Galago montei distinct from *Galago crassicaudata*. Sclater, P. Z. S. 1871, p. 544.

Prosimia rufipes, sp. n., Gray, A. & M. N. II. 1871, vii. p. 339, Madagascar.

Chiromys carnivorous. Owen, *Phil. Trans.* clxi. 1871, p. 237.

CHIROPTERA.

HARTING has calculated the extent of the wings and weight of the pectoral muscles in flying Vertebrates, *Arch. Néerl.* iv. A Bat of the weight of a man would require a pair of wings two and a half metres long, and with a surface equal to one and a half square metre.—C. J. L. KRARUP-HANSEN enters into the mechanism of the flight of Bats in a pamphlet entitled "Beiträge zu einer Theorie des Fluges der Vögel, der Insekten und Fledermäuse." Copenhagen: 1869. 8vo, pp. 42, with woodcuts. [*Cf. Zool. Rec.* vi. p. 28.]

FITZINGER, L. J. Kritische Durchsicht der Ordnung der Flatterthiere oder Handflügler (Chiroptera). Familie der Fle-

dermäuse (*Vespertiliones*), vii. Abtheilung. SB. Ak. Wien, 1871, lxiii. pp. 203–295.
See Zool. Record, vii. p. 8.

Pteropus nicobaricus, sp. n., Zelebor, Novara, Säugethiere, p. 11, from Car-Nicobar.

Cynonycteris collaris has again produced a young one in the Zoological Gardens, Regent's Park. Slater, P. Z. S. 1871, p. 478.

Macroglossus spelæus, sp. n., Dobson, P. A. S. B. 1871, p. 106, and J. A. S. B. 1871, p. 261, pl. 10. figs. 3, 4, Moulmein. It has not the slightest trace of a claw on the index finger.

Cynopterus brachysoma, sp. n., Dobson, P. A. S. B. 1871, p. 105, and J. A. S. B. 1871, p. 260, Andaman Islands.

Atalapha pallescens (Ptrs.) = *A. grayi* (Tomes), and *A. caudata* (Tomes) = *A. ega* (Gervais), Peters, Berlin. Monatsber. 1871, p. 332.

Prof. PETERS (Berlin. Monatsber. 1871, pp. 301–331) has critically examined and systematically arranged the species of Horseshoe Bats (*Rhinolophi*). He has revised their synonymy, and characterized the various divisions. Descriptions are given of the new species only:—

1. RHINOLOPHUS. *a*, subg. *Cælophyllus* with 19 species, of which are new *Rh. truncatus* from Batjan (p. 307), and *Rh. acuminatus* from Java (p. 308); *b*, subg. *Rhinolophus*, with 10 species.

2. PHYLLORHINA. *a*, subg. *Rhinonycteris*, with 1 species; *b*, subg. *Doryrhina*, with 1 species; *c*, subg. *Asellia*, with 3 species; *d*, subg. *Phyllorhina*, with 3 species; *e*, subg. *Gloionycteris*, with 1 species; *f*, subg. *Macronycteris*, with 1 species; *g*, subg. *Speorifera*, with 8 species—new, *Phyllorhina amboinensis* (p. 323); *h*, subg. *Sideroderma*, with 1 species; *i*, subg. *Ptychorhina*, with 1 species; *k*, subg. *Cyclorhina*, with 2 species, *Phyllorhina dorcæ* from Sarawak (p. 326) being new; *l*, subg. *Thyreorhina* for *Phyllorhina coronata*, sp. n., from Mindanao (p. 327); *m*, subg. *Syndesmotis*, with 1 species.

3. CÆLOPS with 1 species.

Triænops (g. n. *Rhinoloph.*) *persicus*, sp. n., Dobson, P. A. S. B. 1871, p. 133, and J. A. S. B. 1871, p. 455, pl. 28, Shiraz.

Phyllorhina trifida, sp. n., Peters, P. Z. S. 1871, p. 513, Burmah.

Phyllorhina nicobarensis, sp. n., Dobson, P. A. S. B. 1871, p. 106, and J. A. S. B. 1871, p. 262, pl. 20. fig. 2, Nicobar Islands.

Asellia stoliczkanæ, sp. n., Dobson, P. A. S. B. 1871, p. 106, and J. A. S. B. 1871, p. 263, pl. 20. fig. 1, Penang.

Miniopterus australis (Tomes) described by Dobson, J. A. S. B. 1871, p. 265.

Vesperus. Dobson (P. A. S. B. 1871, pp. 211, 212) describes *V. pachyotis*, sp. n., from the Khasi Hills; *V. andersoni*, sp. n., from Yunnan; *V. (Nycticejus) atratus*, Blyth; *V. pachypus*, Temm. = *Scotophilus fulvidus*, Blyth.—*V. (Pipistrellus) shiraziensis*, sp. n., P. A. S. B. 1871, p. 134, and J. A. S. B. 1871, p. 459.

Vespertilio (Kerivoula) auratus, sp. n., Dobson, J. A. S. B. 1871, p. 186, pl. 10. figs. 1, 2, Darjeeling.—*Vespertilio (K.) fuscus*, sp. n., Dobson, P. A. S. B. 1871, p. 215, hab. — ?

Vespertilio nepalensis and *V. blanfordi*, spp. nn., Dobson, P. A. S. B. 1871, p. 214; the latter from the Himalayas.

Pipistrellus affinis, sp. n., Dobson, P. S. A. B. 1871, p. 213, Yunan.—*Pipistrellus austenianus*, sp. n., Dobson, *ibid.*, Cherra Punji.—*Pipistrellus annectens*, sp. n., Dobson, *ibid.*, Naga Hills.—*Pipistrellus marginatus* (Cretzschmar) from Shiraz, Dobson, J. A. S. B. 1871, p. 460.

Murina. A species of this genus was, at first, thought by Mr. Dobson to be the type of a new genus, *Stenopterus*, P. A. S. B. 1871, p. 77; but this name is cancelled, J. A. S. B. 1871, p. 186.

Nycticejus emarginatus, sp. n., Dobson, P. A. S. B. 1871, p. 211, hab. —?

INSECTIVORA.

Mr. ST. G. MIVART, having received some additional material since the publication of his paper on the osteology of Insectivora (see Zool. Rec. iv. p. 23), has revised the osteological characters of the various groups and genera, P. Z. S. 1871, pp. 65–79.

Dr. E. VON MARTENS has published a continuation of his article on the names of Mammals in different languages—of Insectivores, in Zool. Gart. 1871, pp. 196–200, 232–237.

Dr. EDUARD BRANDT's pamphlet on the dentition of Shrews (see Zool. Rec. iii. pp. 3 & 24) is published in a German translation in Bull. Mosc. 1871, no. 3, pp. 1–40 (continuation).

✓ *Centetes madagascariensis* is proved by osteological characters to be the type of a distinct genus, *Hemicentetes*. St. G. Mivart, P. Z. S. 1871, pp. 58–66, pl. 5 (skeleton) and woodcuts.—Giebel has come to the same conclusion; he describes the animal, and compares its skull with that of *C. ecaudatus*; he names the genus *Ericius*. Z. ges. Naturw. 1871, iii. pp. 57–60, Taf. 2 (outline figures of skulls).

Cladobates nicobaricus, sp. n., Zelebor, Novara, Säugethiere, p. 17, pls. 1–2 (with skeleton).

Galeopithecus volans. Grube gives as the dental formula:— $i. \frac{0}{2}, c. \frac{1}{1}, m. \frac{2.5}{1.5}$ 48th Jahresbericht schles. Gesellsch. 1871, p. 65.

CARNIVORA.

GERVAIS, P. Mémoire sur les formes cérébrales propres aux Carnivores vivants et fossiles suivi de remarques sur la classification de ces animaux. Ann. Mus. 1870, vi. pp. 103–162, pls. 3–9.

The author distinguishes three principal types:—

1. That of *Canidæ*, which is superior to the two other types.
2. That of *Felidæ*, with which are more or less directly associated *Cryptoprocta*, *Hyæna*, *Proteles*, *Viverra*, *Ichneumon*, and allied genera.
3. That of *Urso-Mustelidæ*.

✓ *Felis*. On the large *Felidae* of Central India, see Forsyth, 'Highlands of Central India.' The Lion was last seen in 1851 (p. 28).

Felis tigris. A pair of Tigers breed regularly every year in the Zoologica Garden at Dresden; and two of the young born last year were reared. Zool. Gart. 1871, p. 371.

Felis tigris. Chinese specimens not a distinct species, M.-Edwards, Recherch. Mammif. p. 206.—Notes on the same variety (*amurensis*) by M. Dode, P. Z. S. 1871, p. 480.

Felis fontanierii described by M.-Edwards, l. c. p. 208, pls. 29–31.

✓ *Felis concolor*. Cranium figured by R. O. Cunningham in 'Notes on the Natural History of the Straits of Magellan,' on a plate, p. 118.

Felis aurata (Temm.) = *F. rutila* (Waterh.) = *F. celidogaster* (Temm.) = *F. neglecta* (Gray) = *F. chalybeata* (H. Smith), from the Gold Coast, is distinct from

Felis moormensis (Hodgs.) = *F. aurata* (Gray &c.) = *F. temminckii* (Vig. & Horsf.), from Nepal, Borneo, Sumatra. Elliot, P. Z. S. 1871, p. 758.

Felis rubiginosa. Notes on a variety from Ceylon (*F. jerdonii*) by Holdsworth, P. Z. S. 1871, pp. 756–758.—It is identical with *Leopardus sumatranus* (Gray), Elliot, P. Z. S. 1871, p. 760.

Felis euphilura, sp. n. (an = *F. undata*, Radde?), Elliot, P. Z. S. 1871, p. 760, pl. 76, Siberia.

Felis catus. F. Leydig confirms the Wild Cat's possession of anal glands, and mentions that he once observed a distinct brush on the tip of the ear of a Domestic Cat. Württemb. Jahresh. 1871, p. 202.

Felis domestica. F. Lenormant has made researches into the history of the Domestic Cat in ancient times, Compt. Rend. 1870, lxxi. pp. 738–743. One of the most interesting points of this paper is, that the author has arrived at the same conclusion as Prof. Rolleston (whose memoir seems to have been unknown to him, see Zool. Rec. iv. p. 26), viz. that the ancient Greeks and Romans kept in a state of domestication the Common Marten, but not the Cat.

Hyæna brunnea. On the female generative organs, viscera, and fleshy parts, Murie, Trans. Zool. Soc. vii. 1871, pp. 503–512, pl. 63.

Viverra civetta (?). An example from Quiah, north of the Cameroons, has provisionally been thus named by Sclater, P. Z. S. 1871, p. 299, and is figured on pl. 29.

Canis lateralis (Sclater, 1870) = *C. adusta* (Sundeval), Gray, A. & M. N. H. 1871, vii. p. 19.

Canis occidentalis in Greenland, R. Brown, A. & M. N. H. 1871, vii. p. 65.

Putorius fontanierii, sp. n., M.-Edwards, Recherch. Mammif. p. 205, pl. 61. fig. 1, Peking.

Ursus arctos. Some observations on its habits, made in Russia by Count zu Münster, Zool. Gart. 1871, pp. 97–103.

Ursus ornatus. Notes taken from a living specimen by Max Schmidt, Zool. Gart. 1871, pp. 304–306.

Ursus nasutus (Sclater) = *U. americanus*, Sclater, P. Z. S. 1871, p. 232.

Cercopithecus caudivolvulus. On the myology of the limbs, J. Beswick-Perrin, P. Z. S. 1871, pp. 547–559.

Meles leptorhynchus described by M.-Edwards, Recherch. Mammif. p. 190, pls. 25-28; *Meles (Arctonyx) leucolæmus*, *ibid.* p. 195, pls. 24, 26-28.

✓ *Mellivora leuconota* (Selater) = *M. indica*, Selater, P. Z. S. 1871, p. 232.

PINNIPEDIA.

Trichechus rosmarus. Dr. Murie has dissected the young Walrus which lived for a short time in the Zoological Gardens, Regent's Park, and made it the subject of a memoir in Trans. Zool. Soc. 1871, vii. pp. 411-464, pls. 51-55. After some historical remarks he describes the external characters, dentition, and cavity of the mouth, organs of digestion, reproduction (male), circulation and respiration, and the myology, and concludes with observations on the affinities of the Walrus to other Pinnipeds.

Otariidæ. A review of Allen's "Eared Seals" (see Zool. Rec. vii. p. 10), by Mr. T. Gill, has been published in Amer. Natur. 1871, iv. pp. 675-684; and a reply by Mr. Allen, *ibid.* v. pp. 37-42.

Otaria argentata, sp. n., Philippi, Berlin. Monatsber. 1871, p. 558 (skull figured on two plates), from Chile. Prof. Peters, in notes appended to this paper, refers this species to his subgenus *Arctophoca*, and makes some remarks on the uncertainty of distinguishing the species of *Otaria*, in consequence of the insufficiency of the materials in the European collections.

Otaria pusilla. On the milk-dentition, Van Beneden, Bull. Ac. Belg. 1871, xxxi. pp. 145-152, with woodcuts.

Phoca hispida. Prof. Flower has worked out the history of this species, and describes the skull of a specimen obtained on the coast of Norfolk. P. Z. S. 1871, pp. 506-512. [Cf. Zool. Rec. vii. p. 11, note.]

Phoca ursina described by Hector, A. & M. N. II. 1871, viii. pp. 29-31, 427.

RODENTIA.

✕ Dr. E. von MARTENS has published an article on the names of various Rodents in different languages. Zool. Gart. 1871, pp. 355-362.

Sciurus. Dr. Anderson (P. Z. S. 1871) describes as new species from Upper Burma and the Kakhien Hills:—*Sc. sladeni*, p. 139; *Sc. gordonii*, p. 140; and *Sc. quinquestriatus*, p. 142, pl. 10.

Arctomys ludovicianus. "On the habits of the Prairie Dog" in a state of captivity, by B. C. Jillson, Amer. Nat. 1871, v. pp. 24-29.

Arctomys. Dr. Anderson considers *A. bobac* and *A. hæmachalanus* distinct, and describes them, *l. c.* pp. 559, 561.

Lagomys curzonæ described by Dr. Anderson, *l. c.* p. 562.

Mus rattus. Two instances of its occurrence in Norway are recorded by Esmark, the specimens having been probably introduced by ships freighted with corn from the Black Sea. Förh. Selsk. Christian. 1871, p. 486.

On the habits, tameness, and extraordinary prolificness of the albino variety, Kolazy, Verh. z.-b. Ges. Wien, 1871, pp. 731-734.

Mus decumanus. On melanism in this species, A. Milne-Edwards, Ann. Sc. Nat. 1871, xv. art. 7.

Mus palmarum, sp. n., Zelebor, Novara, Säugethiere, p. 26, Taf. 3, Nicobar Islands.

Mus humiliatus, sp. n., M.-Edwards, Recherch. Mammif. p. 137, pl. 41. fig. 1, Mongolia.—*Mus plumbeus*, sp. n., M.-Edwards, *ibid.* p. 138, pl. 43. fig. 2, Tchély.

Mus novæ-zelandiæ is described as a new species by Buller, T. N. Z. Inst. iii. pp. 1–4, pl. 1. Another undetermined species, also from New Zealand, but probably introduced, is figured on the same plate by Dr. Hector.

Mus minutus. Its nidification described by Landois, Zool. Gart. 1871, pp. 162–164, and the “singing” of mice generally, with woodcut.

Hesperomys cognatus. A “singing” individual observed, and on the “singing” of mice generally, Dr. S. Lockwood, Amer. Natur. 1871, v. pp. 761–770.

Cricetulus griseus (1867), *Cricetulus obscurus*, and *Cricetulus longicaudatus*, spp. nn., M.-Edwards, Recherch. Mammif. pp. 133, 136, pls. 12 & 13, Mongolia.

Hyppudæus. Dr. Landois describes the nidification of *H. amphibius* and *H. glareolus*, Zool. Gart. 1871, pp. 165–168.

Arvicola mandarinus, sp. n., M.-Edwards, Recherch. Mammif. p. 129, pl. 12. fig. 4, and pl. 13. fig. 4, Mongolia.

Gerbillus. M.-Edwards (*l. c.*) has made some remarks on this genus, and describes his *G. unguiculatus*, p. 142, and *G. psammophilus* (= *G. brevicaudatus*, M.-Edw. 1867, not Cuv.), p. 144. Both species are figured on pls. 10 A & 11.

Pectinator spekkii. A monograph of this animal by Prof. Peters is published in Trans. Zool. Soc. 1871, vii. pp. 397–409, pls. 48–50.

Hystrix. Notes on the difficulties of determining the species by Sclater, P. Z. S. 1871, p. 233: *Hystrix malabarica* (Sclater) = *H. leucuru*; *Acanthocheirus grotii* (Gray) probably = *H. longicauda* (Marsden), but distinct from *H. hodgsoni*, as well as from *H. javanica*.

Atherura fasciculata. Notes by Sclater, *l. c.* p. 236.

Lepus tibetanus described by Dr. Anderson, P. Z. S. 1871, p. 563.

EDENTATA.

BURMEISTER, H. Osteologische Notizen zur Kunde der Panzerthiere Süd-Amerika's. A. Das Zungenbein der Edentata loricata. Zeitschr. wiss. Zool. 1871, xxi. pp. 418–429, pl. 11a.

Manis dalmanni. On the development of a zygomatic arch in this and other species, Gray, A. & M. N. H. 1871, vii. p. 449; Barron, *ibid.* viii. p. 138.

Chlamydophorus truncatus. The extent of the attachment of the dorsal shield to the middle of the back varies. Gray, A. & M. N. H. 1871, vii. p. 447.—Notes on the osteology, by E. Atkinson. Rep. Brit. Assoc. (1870) 1871, Trans. p. 110.

Dasypus. L. J. Fitzinger has compiled a synopsis of the species. SB. Ak. Wien, 1871, lxiv. pp. 209–267, 329–390.

Myrmecophaga tamandua figured. Sclater, P. Z. S. 1871, pl. 43.

Bradypus. Dr. Gray has subjected the specimens of Sloths in the British Museum to a renewed examination, and published detailed notes on all the species, especially with regard to their craniological characters, P. Z. S. 1871,

pp. 428-449. He describes as new species *Arctopithecus boliviensis*, p. 442, with figure of skull, and *Arctopithecus castaneiceps*, p. 444, with figure of skull, pl. 35, from Nicaragua. Also *A. griseus* and *A. flaccidus* are figured on pls. 36 & 37; and skulls of *Cholæpus didactylus*, p. 432, and *Arctopithecus griseus*, p. 446.

Bradypus. On the order of development of the dentition in the various subgenera, Gray, A. & M. N. H. 1871, vii. p. 451.

Bradypus. L. J. Fitzinger has compiled a synopsis of the species, and introduced two new names, *B. columbicus* and *unicolor*. SB. Ak. Wien, 1871, lxiii. pp. 331-405.

Arctopithecus griseus, sp. n., Gray, A. & M. N. H. 1871, vii. p. 302, Costa Rica.

PACHYDERMATA.

Elephas. On the structure of the teeth, Kollmann, Münch. SB. 1871, pp. 243-253, with a plate.

Elephas primigenius. A contribution to our knowledge of the hairs and integuments of the Mammoth, by J. F. Brandt, Bull. Ac. Sc. St. Pétersb. xv. 1871, pp. 347-351.—Dr. L. von Schrenck has given a very interesting report on recent discoveries of remains of the Mammoth. He regards the occurrence of entirely-preserved animals as quite exceptional. *Ibid.* xvi. 1871, pp. 147-173.

Elephas indicus. "Contributions to the Anatomy of the Indian Elephant Part I. The Thoracic Viscera," by M. Watson, in J. Anat. & Physiol. 1871, pp. 82-94, pl. 6.

Elephas indicus. Notice of a tusk apparently attacked by a parasite. Sclater, P. Z. S. 1871, p. 145.

Elephas africanus. A. Murray treats of a monstrosity (first described in Chapman's 'Travels in South Africa,' ii. p. 98) in which five tusks had grown on the right and four on the left side. The specimen is figured. Journ. of Travel and Nat. Hist. i. p. 265.

Hippopotamus amphibius. Mr. Bartlett describes the birth of a Hippopotamus in the Gardens of the Zoological Society. P. Z. S. 1871, pp. 255-257. The young is figured on pl. 20.

Sus scrofa. Roulin corrects an error into which Lenormant has fallen, and attempts to show that the Sheep was used in ancient Egypt as an auxiliary in agriculture, and not the Pig, as would appear from a passage in Herodotus, misunderstood by a copyist. Compt. Rend. 1871, lxxii. pp. 31-37. (See also *Ovis aries*, p. 16.)

Phacochoerus. Further confirmatory notes regarding the distinctness of *P. æliani* and *P. æthiopicus*, by Sclater, P. Z. S. 1871, pp. 236, 237.

Phacochoerus æthiopicus. On the development of the teeth in young examples, Gray, A. & M. N. H. 1871, viii. p. 138.

Rhinoceros. On horns reproduced or malformed, Sclater, P. Z. S. 1871, pp. 8-11, with 3 woodcuts.

Rhinoceros is mentioned in the Old Testament under the name of "Râm" (Job, xxxix. 12). Rieu, Verhandl. Schweiz. ntrf. Gesellsch. 1868, p. 86.

Tapirus indicus. Dr. Murie, in a paper "On the Malayan Tapir, *Rhinocærus sumatranus*," J. Anat. & Physiol. 1871, pp. 131-169, gives a description of the external features and the myology.

Tapirus bairdi. A young male figured. Sclater, P. Z. S. 1871, p. 626, pl. 50.

Equus caballus. A case of polydactylism in a Horse described and figured by Wood-Mason, P. A. S. B. 1871, p. 18, pl. 1.

Asinus. A. Sanson distinguishes from osteological characters two races or species of the domesticated Ass:—1. A dolichocephalous race, *E. asinus africanus*, originally indigenous in the tertiary basin of the Nile, and now spread over the whole of Asia, Europe, and the north of Africa; and 2. A brachycephalous race, *E. asinus europæus*, originally indigenous in the European part of the tertiary basin of the Mediterranean; now found in the south of France and on the Mediterranean coasts of Africa. Chiefly used for the production of Mules. Compt. Rend. 1871, lxxii. pp. 689–692.

RUMINANTIA.

Bos. “Les bœufs sauvages des Maures,” by T. Turrell, Bull. Acclim. 1871, pp. 516–523. [See Zool. Rec. vii. p. 13.]

▷ *Bos sylhetanus*. On the Gaur, see Forsyth, ‘Highlands of Central India,’ pp. 106 *et seqq.*, 132 *et seqq.*

Ovis. Mr. Blyth has critically examined the account given by Ch. Hamilton Smith of his *Bos* (?) *pegasus*. The authors referred to in this account have vaguely alluded to very different animals; but the figure given by H. Smith in Griffith’s ‘Animal Kingdom’ (iv. p. 386) represents a very extraordinary form of Domestic Sheep. A. & M. N. II. 1871, viii. pp. 204–207.

Ovis aries. On the habits of the Sheep which rendered it a fit auxiliary in certain operations of agriculture in ancient Egypt, Roulin, Compt. Rend. 1871, lxxii. pp. 317–326. (See also *Sus scrofa*, p. 15.)

▷ *Antelope*. On the Antelopes inhabiting Central India, see Forsyth, ‘Highlands of Central India,’ pp. 56 *et seqq.*

Antelope caudata described by M.-Edwards, Recherch. Mammif. p. 186, pls. 22, 22 A, 22 B.—It is the type of a distinct genus, *Urotragus*, Gray, A. & M. N. H. 1871, viii. p. 371.

Neotragus saltianus. Note on the skull by Gray, l. c. p. 141.

Damalis pygarga. Note on its scarcity, by Layard, P. Z. S. 1871, p. 625.

Tragelaphus. Sir V. Brooke has reviewed the history of *T. spekii*, *angasi*, and *euryceros*, determined their distinctive external and craniological characters, and figured the last species (pl. 39). P. Z. S. 1871, pp. 482–489, with woodcuts of skulls and horns.

Cephalophus. Dr. Gray has reviewed these Antelopes, and characterizes all the species known, P. Z. S. 1871, pp. 588–601. He divides them into three groups, *Grimmia*, *Terpone*, and *Cephalophus*; describes two new species, *Cephalophus melanoprymnus* (p. 594, pl. 44) and *Cephalophus nigrifrons* (p. 598, pl. 46), from the Gaboon, and figures the skulls of *Grimmia irrorata* (p. 590), *C. melanoprymnus* (p. 594), *C. sylvicultrix* (p. 596), *C. rufilatus* (p. 597), *C. nigrifrons* (p. 598), *C. coronatus* (p. 599), and *C. maxwellii* (p. 600). *C. melanoprymnus*, *C. dorsalis*, and *C. nigrifrons*, figured pls. xlii.–xlii.

Camelopardalis. The Giraffe is mentioned in the Old Testament under the name of “Rehem” (Psalm xcii. 10). Rieu, Verhandl. Schweiz. ntrf. Gesellsch. 1868, p. 86.

▷ *Cervus*. Forsyth (Highlands of Central India, p. 221) has convinced

himself, from repeated observations, that Indian Deer do not shed their horns annually.

Cervus. Mr. Sclater has published a report on certain species of Deer now or lately living in the Zoological Gardens, Regent's Park. Trans. Zool. Soc. 1871, vii. pp. 333-352. These notes refer chiefly to the synonymy and geographical distribution of the species, and to the history of their introduction into the Menagerie. The species are the following:—

1. *Cervus davidianus*, p. 333, pl. 28, young male and female. The author reduces *Elaphurus* to the rank of a subgeneric group.

2. *Cervus maral*, p. 336, pl. 29, male, female, and fawn. It is doubtful for which Deer the term *C. wallichi* was originally intended; consequently it has been misapplied more than once; but probably it belongs to *C. affinis*.

3. *Cervus cashmirianus*, p. 339, pl. 30, adult male.

4. *Cervus mantschuricus*, p. 345, pls. 31 & 32, male in summer and winter dress.

5. *Cervus taevanus*, p. 345, pls. 33 & 34, male, female, and young.

6. *Cervus sika*, p. 346, pl. 35, male and female.

7. *Cervus duvauceli*, p. 346, pl. 36, male and female.

8. *Cervus eldi*, p. 348, pls. 37 & 38, male in summer and winter dress.

9. *Cervus swinhooi*, p. 349, pl. 39, male.

Woodcuts of the heads of most of these species are added.

Cervus taevanus = *C. pseudaxis* (Eyd. & Soul.). Swinhoe & Sclater, P. Z. S. 1871, p. 237.

Cervus alfredi (Sclater). Antler figured. Sclater, *l. c.* It is from the Philippine Islands, *id.*, *ibid.* p. 478.

Cervus pudu, figured, *l. c.* pl. xvii. Antlers figured. Sclater, *l. c.* pp. 238, 239.

Cervus xanthopygus described by M.-Edwards, Recherch. Mammif. p. 181, pl. 21.—*Cervus mandarinus*, sp. n., M.-Edwards, *ibid.* p. 184, pls. 22 & 22 A, Peking.

Cervus alces. The memoir by J. F. Brandt, an abstract of which we have noticed in Zool. Record, vii. p. 14, has been published in Mém. Ac. St. Pétersb. xvi. no. 5, 1870, pp. 84, with 3 plates. As the contents and scope of this excellent and painstaking treatise are properly described by the title, we give it here in full:—"Beiträge zur Naturgeschichte des Elends in Bezug auf seine morphologischen und palæontologischen Verhältnisse, sowie seine geographische Verbreitung nebst Bemerkungen über die miocene Flora und Insectenfauna des Hochnordens." The figures on the three plates represent numerous variations of the horns.—A note on "Spike-horns" (see Zool. Rec. vii. p. 14), by Putnam, in Amer. Nat. 1871, iv. p. 763.

Cervus capreolus. Horns, abnormally developed, figured by Gray, P. Z. S. 1871, p. 601.

Hydropotes inermis has constantly five or six young ones at a birth. Hamilton, P. Z. S. 1871, p. 258.—Remarks on the skull, *id.*, *ibid.* p. 702.

Auchenia lama. Historical notes, with some other observations on the Guanaco, in R. O. Cunningham's 'Notes on the Natural History of the Strait of Magellan,' p. 106, with a plate representing the skull.—Notes on the Guanaco in the wild state by Masters, 'At Home with the Patagonians,' London, 1871, 8vo. It has only one young at a birth.

SIRENIA.

Rhytina borealis. Dr. ALEX. BRANDT has found a piece of dried skin in the St.-Petersburg Museum which he believes belonged to this animal. He describes it in *Mém. Acad. St. Pétersb.* 1871, vol. xvii. no. 7 (pp. 28, with a plate). It is rough and furrowed, like the bark of a tree, an appearance produced by a parasite (*Cyamuc rhytinæ*); normally the skin was smooth, and sparsely covered with bristle-like hairs.

CETACEA.

W. D. MURISON attributes the disappearance of Whales from the New-Zealand shores to the fact of their wholesale destruction during the breeding-season. *P. N. Z. Inst.* iii. pp. 68-70.

Prof. TURNER having had the opportunity of examining the gravid uterus of an *Orca gladiator*, has published a description of it in a memoir "On the gravid Uterus, and on the arrangement of the foetal membranes in the Cetacea." *Trans. R. Soc. Edinb.* xxvi. 1871, pp. 467-504, pls. 17 & 18, and woodcuts.

Hr. A. W. MALM has published an account of the specimens preserved in Swedish collections (1869):—"Hvaldjur i Sveriges Museer, år 1869," *Sv. Ak. Handl.* ix. no. 2, 1871, pp. 104, with 6 plates. He reviews the publications of his predecessors on the same subject, and directs attention more particularly to the carpus and pelvis as means of distinguishing the various forms. These notes refer to the following species:—

Balæna mysticetus, p. 32, figs. 1 & 2 (scapula and vertebra).

Hunterius swedenborgii, p. 34.

Hunterius glacialis, p. 35, fig. 3 (eighth rib).

Megaptera longimana, p. 35, figs. 5 & 6 (ribs and vertebræ).

Megaptera americana, p. 38, fig. 4 (fore limb and ribs), fig. 28 (carpus).

Eschrichtius robustus, p. 39.

Physalus musculus, p. 40.

Physalus antarcticus, p. 40, fig. 7 (occipital region and vertebra).

Cuvierius carolinæ, p. 42, fig. 8 (skull).

Balenoptera rostrata, p. 44, fig. 9 (maxillary), fig. 32 (carpus).

Catodon macrocephalus, p. 45.

Pontoporia tenuirostris, *sp. n.*, p. 46, = *P. blainvillii*, Flower, nec Gray, fig. 10 (entire animal and skull), fig. 34 (fore limb).

Steno frontatus, p. 49.

Steno attenuatus, p. 51.

Steno consimilis, *sp. n.*, p. 52, fig. 53 (skull).

Delphinus longirostris, p. 53, fig. 11 (part of snout).

Delphinus delphis, p. 54, fig. 12 (part of snout).

Delphinus major, p. 56, fig. 13 (part of mandible).

- Delphinus frithii*, p. 57.
Delphinus moorei, p. 57, fig. 36 (carpus).
Delphinus walkeri, p. 59, fig. 37 (carpus).
Clymenia doris, p. 60.
Clymenia euphrosynoides, p. 62.
Clymenia burmeisteri, *sp. n.*, p. 63, fig. 54 (skull).
Clymenia obscura, p. 64.
Clymenia similis, p. 65, fig. 38 (carpus).
Delphinapterus peronii, p. 66, fig. 39 (carpus).
Tursio truncatus, p. 67.
Electra clancula, p. 68, fig. 40 (carpus).
Electra acuta, p. 69, fig. 41 (carpus).
Lagenorhynchus albirostris, p. 70, figs. 21-23 (os ischii), fig. 42 (carpus).
Pseudorca crassidens, p. 73, fig. 43 (carpus).
Phocæna communis, p. 74, figs. 18-20 (os ischii), fig. 44 (carpus).
Neomeris phocænoides, p. 77, fig. 45 (carpus).
Orca gladiator, p. 78, fig. 46 (carpus).
Orca minor, p. 81, fig. 24 (caudal vertebra).
Orca eschrichtii, p. 83.
Globiocephalus srineval, p. 84, fig. 47 (carpus).
Globiocephalus propinquus, *sp. n.*, p. 85, from the Equator, fig. 48 (fore limb).
Platanista gangetica, fig. 33 (arm and carpus).
Beluga catodon, p. 88, figs. 14-17 (vertebræ, ribs, and hyoid bone), fig. 49 (carpus).
Monodon monoceros, p. 93, fig. 50 (carpus).
Hyperoodon butskopf, p. 93.
Lagenocetus borealis, p. 94, fig. 25 (humerus, radius, and ulna).
Ziphius cavirostris, p. 95, fig. 51 (carpus).
Micropteron bidens, p. 96, fig. 52 (carpus).

Balæna. "Remarques sur l'anatomie des Cétacés de la division des Balénidés, tirées de l'examen des pièces relatives à ces animaux qui sont conservées au Muséum d'histoire naturelle," by P. GÉRAVAIS, in *Compt. Rend.* 1871, lxxii. pp. 663-672, and in *Nouv. Arch. Mus. Paris*, 1871, vii. pp. 65-144, pls. 3-6.

(These notes contain an historical account of the specimens in the Paris Museum, and an examination of the following points:—

1. On the peculiarities of structure observed in a vertical longitudinal section of the skull.
2. On the vomer and supravomerine cartilage.
3. On the palatine bones.
4. On the characters furnished by the sternum.
5. On the brain of the species of Balænidæ.
6. On the classification.

Prof. TURNER, in a paper entitled "On the so-called two-headed ribs in Whales and in Man," and published in *Journ. Anat. & Phys.* v. pp. 348-361, arrives at the same conclusions as Van Beneden, with regard to their nature and systematic value.

Balæna biscayensis. Notes on this species by Fischer, Compt. Rend. 1871, lxxii. pp. 298-300. The author regards the generic group *Hunterius* as justified, and does not think that the identity of *B. biscayensis* with a Whale from eastern North America has been proved.—The same subject is more fully discussed by the same author in Ann. Sc. Nat. 1871, xv. art. 3. pp. 20. He has collected all the documents and literary materials relating to the Balænas of the temperate regions of the North Atlantic, and especially to the *B. biscayensis*. He shows that they have been distinguished by the following denominations:—

1. *B. biscayensis*, in the Bay of Biscay.
2. *Nord kaper*, in Norway and Iceland.
3. *Baleine de* [sic] *Sardes*, on the banks of Newfoundland.
4. *B. cisarctica*, on the eastern coasts of North America.
5. *Hunterius swedenborgi*, subfossil in Gothland.
6. *Balæna lamanoni*, subfossil near Paris.

Without discussing the specific differences of these Whales, the author thinks that the *B. biscayensis*, "*Nord kaper*," and *Hunterius swedenborgi* should be united in one generic group, allied to *H. temmincki*, and characterized by a very small head, bifid first rib, and thickened and rounded extremities of the ribs. The other three Whales agree with one another and with *B. australis* and *antipodum* in having a longer head, simple first rib, and compressed lower ends of the ribs.

Megaptera bellicosa, sp. n., Cope, P. Am. Phil. Soc. 1871, pp. 103-108, with woodcuts, Caribbean Sea.

Balænoptera musculus. "Mémoire sur une Balénoptère capturée dans l'Escaut en 1869," by P. J. VAN BENEDEN, in Mém. Ac. Belg. xxxviii. 1871, pp. 36, with two plates. In the introductory remarks the author criticizes the proposed genera and species of European Fin-Whales, and gives a list of the individuals captured.

Balænoptera musculus. "On some points in the anatomy of a great Fin-Whale," by J. Struthers, in J. Anat. & Physiol. 1871, pp. 107-125, pl. 7. This refers to the individual found dead on the Aberdeen coast in 1871, June. → A young example figured by Gervais, Nouv. Arch. Mus. Paris, 1871, vii. pl. 3 (*B. rostrata*).

Balænoptera sibbaldi. "On the transverse processes of the seventh cervical vertebra." Turner, Journ. Anat. & Phys. v. pp. 361, 362.—Notes on the Steypireyör, by Henry Bird. Rep. Brit. Assoc. (1870) 1871, Trans. p. 112

Sibbaldius sulphureus. Baleen described by Cope, P. Am. Phil. Soc. 1871, p. 108.

Physeterideæ. A semipopular article, "The Sperm-Whales, giant and pigmy," by T. GILL, in Amer. Natur. 1871, iv. pp. 725-743, with numerous woodcuts.

→ *Kogia floweri*, sp. n., Gill, Amer. Natur. 1871, iv. p. 738, figs. 167 & 172, Lower California.

Physeter macrocephalus. Prof. Turner records the evidence of a Sperm-Whale captured in 1829, on the coast of Argylshire; on this occasion he has collected the reports of former similar captures; nearly all the individuals appear to have been males. Proc. R. Soc. Edinb. 1871, pp. 365-370.

Monodon monoceros. Mr. J. W. CLARK describes and figures a skull with two fully developed tusks belonging to a skeleton in the Museum of the University of Cambridge, and gives the history of the literature of this subject. He shows that there are now at least ten other bidental skulls in existence in different European museums. P. Z. S. 1871, pp. 42-53, with 2 woodcuts.

Phocæna communis appears to occur near the Queen Charlotte's Islands, Gray, A. & M. N. H. vii. 1871, p. 64.

Orcella fluminalis from the Irrawaddy is distinguished as a new species from *Phocæna brevirostris* (Owen) by Dr. J. Anderson, P. Z. S. 1871, pp. 142-144; both dolphins are figured in outline.

Lagenorhynchus albirostris. Dr. Murie has published notes on a male specimen, describing the dentition, the pharynx, and neighbouring structures, articulation of the mandible, the urogenital organs, and some muscles. Journ. Linn. Soc. 1871, pp. 141-153, pl. 5.

Ziphius layardi. Notes on a specimen of this or a closely allied species, obtained on the coast of New South Wales, by Kressl, P. Z. S. 1871, p. 630.

Berardius. Mr. Knox and Dr. Hector have published notes on three specimens of Ziphioid Whales stranded on the coasts of New Zealand, Trans. N. Z. Inst. 1871, pp. 125-129, and figured the skulls of two individuals, pls. 14-17.—Dr. Gray shows that these Cetaceans belong to *Berardius*, and more especially the specimen figured on pls. 16, 17 to *B. arnouxii*, whilst plates 14 and 15 represent a new species, *Berardius hectori*. A. & M. N. H. 1871, viii. pp. 115-117.

Diplodon sechellensis. Additional notes on the skeleton from Lord Howe's Island [see Zool. Rec. vii. p. 18] by Dr. Gray, A. & M. N. H. 1871, vii. pp. 291, 292, with woodcuts.

Mesoplodon guentheri is indicated as a new species from New South Wales by Kressl, A. & M. N. H. 1871, vii. p. 363, with woodcut of tooth. Dr. Gray regards it as the type of a distinct genus, *Callidon*, *ibid*.

MARSUPIALIA.

OWEN, R. On the Fossil Mammals of Australia.—Part IV. Dentition and mandible of *Thylacoleo carnifex*, with remarks on the arguments for its Herbivory. Phil. Trans. clxi. 1871, pp. 213-266, with pls. 11-14 and twenty woodcuts.

We bring to the notice of zoologists this palæontological paper, on account of the numerous references to and illustrations of recent forms. The mandibular characters of carnivorous and herbivorous Marsupials are discussed on pp. 233-237.

✓ *Macropus major*. Pagenstecher has examined an embryo nearly mature; he confirms on this occasion Owen's statement, that no communication exists between the median vaginal cæcum and the vestibule, whilst, on the contrary, *Halmaturus bennetti* shows a complete open communication. Verh. ntrh. Verein. Heidelberg, vol. v.; translated in A. & M. N. H. 1871, viii. pp. 292-294.

Halmaturus erubescens. Skull figured. Sclater, P. Z. S. 1871, p. 240.

MONOTREMATA.

✓ *Ornithorhynchus*. "On the myology of the *Ornithorhynchus*," by E. Coues, P. Ess. Inst. vi. part 2.

AVES

BY

R. B. SHARPE, F.L.S., F.Z.S., &c.

THE bulk of the present 'Record' sufficiently testifies to the activity of ornithologists in all parts of the globe. It may be doubted if there has ever been a year so productive of genuine progress in this branch of science.

BIBLIOGRAPHY AND CRITICISM.

CABANIS, J., REICHENOW, A., & HELM, M. General-Index zum Journal für Ornithologie. Inhaltsverzeichniss der Ersten 15 Jahrgänge, 1853-1867, enthaltend: Systematischer Index aller lateinischen Familien-, Genus- und Artnamen sowie ein Autoren- und Sachregister und Verzeichniss der Abbildungen, in alphabetischer Ordnung. Cassel: 1870. 8vo, pp. 1-211.

This supplies a great want. The title explains its scope.

HARTING, J. E. The Ornithology of Shakespeare, critically examined, explained, and illustrated. London: 1871. 8vo, pp. 321.

A very good and pretty book, the result of six years' labour, on an interesting subject.

HARTLAUB, G. Bericht über die Leistungen in der Naturgeschichte der Vögel während des Jahres 1870. Arch. f. Nat. xxxvii. Band ii. pp. 44.

Remarkable for the absence of any allusion to "the most important ornithological work of the year" (Zool. Rec. vii. p. 21) — 'Die Vögel Ost-Afrika's' of the author and Dr. Finsch.

SALVIN, O., & SCLATER, P. L. Index of the Ornithological Literature of 1870. Ibis, 1871, pp. 417-484.

The titles of the various papers published during the year 1870 are here collected and arranged alphabetically under the authors' names, that of each new species being also mentioned.

THE GENERAL SUBJECT.

(ALLEN, J. A. On the Mammals and Winter Birds of East Florida, with an Examination of certain assumed Specific Characters in Birds, and a Sketch of the Bird-Faunæ of Eastern North America. Bull. Mus. C. Z. ii. pp. 161-450, pls. iv.-viii.

Perhaps the most important ornithological publication of the year, and one possessing an interest far beyond the limited scope its title intimates, though it cannot be said that the subject is clearly treated—very likely because clear treatment is at present impossible. [After a brief Introduction, Part I. (pp. 163-167) is devoted to the Topographical, Climatic, and Faunal Characteristics of East Florida. Part II. is a list of Mammals; and with Part III. (pp. 186-250) the general interest of the essay begins. It is on Individual and Geographical Variation among Birds, considered with respect to its bearing upon the Value of certain assumed Specific Characters. First, Individual Variation is taken, whether (*a*) in colour generally (p. 187), and depending on season (p. 192) and age (p. 193), or (*b*) in size, generally (p. 197) or proportionally (p. 199), such as relative length of the wings and tail, and (p. 205) variation in the number of *rectrices*, or (p. 220) individual variation in the size and form of the bill. Then we have (*c*) Variations in size and form of the Bill, Wings, and such like, resulting from age (p. 226), followed by (*d*) General Remarks on Individual Variation (p. 228) and (*e*) on Climatic Variation (p. 229); (*f*) remarks on Species, Varieties, and Geographical Races (p. 242), concluding this Part. Part IV. (pp. 250-375) gives a list of the Winter Birds of East Florida, and, though of more special interest, well deserves study. Part V. (pp. 375-425) is on the General Distribution of the Birds of Eastern North America, with special reference to the number and circumscription of the Faunas, and, after (1) Introductory Remarks, treats of (2) the Natural Provinces of the North-American Temperate Region (p. 384), (3) the seven Ornithological Faunas of the Eastern Province of that Region, viz. the Floridian (p. 391), Louisianian (p. 392), Carolinian (p. 393), Alleghanian (p. 395), Canadian (p. 398), Hudsonian (p. 400), and American Arctic (p. 403), these being all considered in reference to the range of Mammals and Reptiles—(4) the Ornithological Districts of the Region (p. 406), and (5) the Geographical Range of the Species (p. 407), followed (p. 418) by General Remarks on the Distribution and Migration of the Birds of the Eastern Province. An Appendix (p. 426) contains a sufficiently complete bibliographical list; and the plates show some remarkable variations in the form and size of the bill in 16 spe-

cies of birds. The numerous tables of measurements and the like, which are interspersed throughout the work, call for especial remark; for whatever may be thought of the author's arguments (and it is here out of place to pass an opinion on them), the facts therein recorded speak for themselves. The following abstract of his results, however, slightly abbreviated from his own account of them in the Introduction, may be of use:—(1) the majority of nominal species are caused by imperfect knowledge of the extent and character of (a) individual and (b) geographical variation; (2) this imperfect knowledge is due to the neglected study of common species; (3) the analytic mode of study should not alone be pursued, but combined with the synthetic—general principles being sought as well as new forms; (4) nothing is gained by giving binomial names to climatic and other forms, when a complete transition from the one to the other can be traced in a large series of specimens.

Such is an imperfect analysis of this important work. Into the special part of it it is not intended to enter. Ordinary species-makers will hardly accept the identifications of an ornithologist of such broad views as Mr. Allen; and the book itself must and will be consulted by those who like general principles. (Cf. *Ibis*, 1872, pp. 189–191.)

BREHM, A. E. Gefangene Vögel. Ein Hand- und Lehrbuch für Liebhaber und Pfleger einheimischer und fremdländischer Käfigvögel. Leipzig: 1870.

Not seen by the Recorder.

——. Bird-Life. Translated from the German by H. M. LABOUCHERE and W. JESSE. London: 1871. 8vo. Parts i.–iii. pp. 1–252.

The translators' part is performed with great care. Like most popular works, this is very weak in many points; especially may be mentioned the essay on "general distribution," concerning which much sounder information was easily within the author's reach.

COLLETT, R. Rugecasser for vore nyttige Smaafugle, deres Indretning og Beboere. Christiania: 1870. 8vo, 36 pp.

Advocating the protection of small birds, and showing how they may be encouraged by artificial breeding-boxes.

DARWIN, C. The Descent of Man, and Selection in Relation to Sex. London: 1871. Sm. 8vo, 2 vols. pp. 423, 475.

Presuming that the reader is aware of the general drift of the author's argument, with which we have here nothing to do, the part of this work relating to Birds will be found in four chapters (xiii.–xvi.) of the second volume (pp. 38–238), wherein the subject of the Secondary Sexual Characters of the Class is treated

at considerable length, though concisely enough when we remember that in Birds more than in any other animals are these characters diversified and conspicuous, and that there is scarcely an ornithologist of repute but has had something new to say of them.

After briefly mentioning some sexual Differences in Structure which seem to depend on Differences in Habit, as the bills of *Grypus*, *Neomorpha*, and even *Carduelis*, Mr. Darwin (p. 40) notices such differences as are connected with the extreme Pugnacity of the Males, citing among many other instances those in *Machetes** (the only case among Birds of a structure serving as a shield), the polygamous *Gallinæ*, some of the *Anseres*, and especially *Palamedea*. Then are considered the Sounds made by Birds, whether Vocal (p. 51)—of which most of the *Passeres*, some species of *Tetrao*, *Cephalopterus*, *Cygnus*, and *Grus* furnish examples,—or Instrumental (p. 61), as illustrated by *Tetrao* again, *Upupa*, *Scolopax gallinago*, some *Trochilidæ*, and *Pipra deliciosa*. Love-Antics and Dances, as performed especially by *Chlamydera* and its allies, form the next branch of the subject (p. 68), to which naturally follows the question of Decoration (p. 71), whether permanent or seasonal, the last leading logically to remarks on Moulting (p. 80), and a separation of those birds which have a Double Moults into five groups—those wherein (i.) the sexes are generally alike all the year round, (ii.) the sexes resemble each other though undergoing a slight change according to season, (iii.) the seasonal change is very great, (iv.) the males resemble the females for most part of the year, but undergo a change during the rest, or (v.), the sexes being always unlike, the males undergo a greater change at each recurrent season. Proof of the Display of their plumage by Males (p. 86) concludes this chapter.

The next chapter begins with Choice as exercised by the Females (p. 99), and then shows (p. 100) that Courtship is often a prolonged affair, and leaves many Unpaired Birds (p. 103). Then the Mental Powers of Birds are considered (p. 108), and the attachment they feel for their comrades and owners; their faculties of observation, especially as regards colours and ornaments, all receive due illustration. Numerous facts bearing on the Preference of Females for Particular Males are next cited (p. 113); and then we come back (p. 124) to the old question of Variability and Inheritance as the foundation of Selection, whether Natural or Sexual; and this gives rise (p. 132) to one of the most remarkable and ingenious ideas of the many which pervade the whole work, that which suggests the origin and formation of

* [Neither in this nor in his other works does Mr. Darwin seem to have noticed sufficiently the individual variability of the male of this bird, which in this respect is believed to stand alone among animals.—Ed.]

"ocelli" on birds' feathers. These are traced by successive steps from their beginning as simple spots, through many phases (as, for example, when they are confluent in the train of *Pavo*), till they culminate in the wonderful "ball-and-socket" aspect they take in *Argus*—the process being illustrated by Mr. Ford's admirable woodcuts.

The following chapter (p. 154) treats of the questions why in some Birds the Female is Less Ornamented than the Male, while in others Both Sexes are Equally Ornamented; and thereto the point whether a character at first inherited by both sexes can be transmitted to one only is discussed. Mr. Wallace's Theory (Zool. Rec. v. p. 64) is next considered (p. 166), and, notwithstanding certain obvious objections, its main principles are admitted. With the addition of a few words on the Changes of Plumage in Relation to Season (p. 180) the chapter ends.

The whole subject is concluded in the next chapter, beginning with the Transmission of Characters as Limited by Age (p. 183); and the frequency with which the young of some species differ from their parents but resemble the adults of nearly allied species is fully shown. Then, by way of superseding the "Laws of Plumage" laid down by Cuvier, and well known to require rectification, Six Classes of Cases under which the differences and resemblances between young and old of both sexes, or of one sex alone, can be grouped are stated (p. 187). These are:—(i.) when the old cock surpasses the hen in beauty the young resemble her; (ii.) when the old hen surpasses the cock the young resemble him; (iii.) when the parents are alike the young have a peculiar dress; (iv.) when parents and young are both alike; (v.) when the parents, whether the sexes are alike or not, have a distinct seasonal plumage the young (*a*) resemble them in their winter dress, or (*b*) much more rarely in their summer dress, (*c*) resemble the hen only, (*d*) have an intermediate character, or (*e*) may greatly differ from any plumage of the adult; and (vi.) when the young in their first plumage differ according to their sex, the cocks favouring their father, the hens taking after their mother. These cases, which seem to be exhaustive, are very fully considered in the following pages; and their Protective Colouring (p. 223) is treated,—the whole being brought to a close (p. 232) by an excellent Summary of the Argument, which is not here attempted, as being beyond the scope of this annual.

FRAUENFELD, G. VON. Die Grundlagen des Vogelschutzgesetzes.
Wien: 1871. 8vo, pp. 12.

Advocating the utility and protection of small birds.

— Der Vogelschutz. Verz. z.-b. Wien, xxi. pp. 1148–1196.

To the same effect as the foregoing, but with the addition of a running commentary on the birds of Europe.

GIGLIOLI, E. H. Note intorno alla Distribuzione della Fauna Vertebrata nell' Oceano prese durante un viaggio intorno al Globo 1865-68. Firenze : 1870. 8vo, pp. 96, with a map.

The birds treated (pp. 24-71) belong to the families *Pelecanidæ*, *Laridæ*, *Procellariidæ*, and *Spheniscidæ*, but do not call for any general remarks. The map shows where many of the species were obtained.

GRAY, G. R. Hand-list of Genera and Species of Birds, distinguishing those contained in the British Museum. Part III. *Struthionæ*, *Grallæ*, and *Anseres*. London : 1871. Pp. i-xi, 1-350.

The completion of this great work [cf. Zool. Rec. vi. p. 27, ^{viii 2k} vii. p. 20), the last, unfortunately, that we are to receive from the author's pen, enables us to appreciate fully the labour employed in its compilation when we examine the index, consisting of nearly 220 pages. It must always be regretted, however, that the absence of references renders the work little more than a guide-post to the student; while another drawback lies in the many important identifications and corrections which occur in almost every page of the index, so as hardly to attract notice. Apart from these defects we can only admit the general utility of the work, while our admiration for the painstaking courage of the author in undertaking so vast a labour at such an advanced age is mixed with regret at its having deprived us of one of the heads of our science.

HARTING, J. E. Hints on Shore-shooting, with a chapter on skinning and preserving Birds. London : 1871. Sm. 8vo, pp. 88.

The sporting naturalist, or naturalist-sportsman, will find the subject well treated.

HARTING, P. De Taal en de Stein der Dieren. JB. zool. Gen. Amst. 1871, pp. 141-174.

An essay on the cries and notes of animals, concluding with a description of the vocal organs in the different classes, illustrated by woodcuts.

JESSE, W. [See BREHM, A. E.]

KEULEMANS, J. G. Onze Vogels in Huis en Tuin. Leyden : 1869-71. 8vo.

—. A Natural History of Cage-Birds. London : 1871. Parts 1-4.

Books for the bird-fancier, of more than average excellence, containing good coloured figures of many of the species by the author whose account of the habits and management of the birds is commendable. The species, whether European or exotic, repre-

sented in the plates have been so often figured that a list of them is unnecessary.

KJÄRBÖLLING, F., Jun. Der zoologische Garten zu Friedrichsburg bei Kopenhagen. Zool. Gart. 1871, pp. 19-23.

Mentions the breeding of several birds in confinement, the most interesting being *Syrnhaptes paradoxus*.

KOCH, G. VON. Die Stellungen der Vögel. Heidelberg : 1871. Heft 1.

We only know this work by a specimen plate. Its object is to furnish natural attitudes for bird-stuffers.

LABOUCHERE, H. M., & JESSE, W. [See BREHM, A. E.]

LIEBE, K. T. Einige neue Erfahrungen betreffs der Zucht einheimischer besonders insectenfressenden Vögel. Zool. Gart. 1871, pp. 343-347.

MILNE-EDWARDS, A. Recherches Anatomiques et Paléontologiques pour servir à l'histoire des Oiseaux Fossiles de la France. Paris : 1871. 4to, plates.

This magnificent work is now completed, the remaining portion of the treatise on the "Gallinacés" (Zool. Rec. vi. p. 29) being followed by accounts of "Colombides," "Passereaux" (in a very wide sense, including *Picariæ* as well as normal *Passeres*), the Diurnal and Nocturnal Birds-of-prey and the "Psittacides." To these succeeds a Second Part, giving a general survey of the geological distribution of Birds' remains in different formations. The execution of the whole is beyond praise. Such of the named fossil species as can be positively referred to existing families will be found noticed in the special part of this Record; but there are several of the author's "Passereaux," the relations of which cannot be determined; and to prevent mistakes these are here mentioned. (Each forms the type of a new genus; and they are:—*Cryptornis antiquus*, pl. 175; *Laurillardia longirostris*, pl. 161. fig. 1; *Palægithalus cuvieri*, pl. 161. figs. 2, 3; *Homalopus picoides*, pl. 178. figs. 15-31; *Necrornis palustris*, pl. 178. figs. 6-14; *Limnatornis paludicola*, pl. 176. figs. 14-18, pl. 177. figs. 14-17.) Many other ornitholites are also figured, which, from their fragmentary state, at present defy determination. These must necessarily remain unnoticed here. The existence in France of fossils which can be referred to such forms as *Serpentarius*, *Psittacus*, *Trogon* and *Collocalia*, to say nothing of *Strix nyctea*, requires remark.

NETTO, L. Investigações historicas e scientificas sobre o Museu Imperial e nacional do Rio de Janeiro. Rio de Janeiro : 1870. 8vo, pp. 310.

The ornithological portion, which contains some original observations, is to be found at pp. 181-225.

NEWTON, ALFRED. On a method of Registering Natural-History Observations. Tr. Norw. Soc. 1870-71, pp. 25-32, with a plate.

The observations, though somewhat minute in the case of birds, being recorded symbolically, can be written down in a very few minutes, according to the method, which is fully explained. The Register was kept at Elveden for more than ten years by the author and his brother.

NOLL, F. C. Mittel und Wege zur Ausbreitung der Thiere. Zool. Gart. 1871, pp. 170-175, 204-210, 237-241, 269-275.

An interesting paper. [As examples of birds which have of late extended their range, *Syrnhaptes paradoxus* and *Galerita cristata* are mentioned.]

SCHLEGEL, H. Observations Zoologiques, IV., V. N. T. D. iv. pp. 1-61*.

The first of these papers recounts some remarkable discoveries made in Geelvink Bay; the second describes several new genera and species discovered by Herr von Rosenberg in the interior of New Guinea. (See *Strigidae*, *Psittaci*, *Cuculidae*, *Alcedinidae*, *Pittidae*, *Meliphagidae*, *Nectariniidae*, *Campephagidae*, *Muscicapidae*, *Sturnidae*, *Paradisiidae*, *Columbidae*, *Scolopacidae*, *Rallidae*, and *Casuariidae*.)

(RUSS, K. Handbuch für Vogelliebhaber, -Züchter und -Händler. Hannover: 1871.

Not seen by the Recorder.

SCLATER, P. L. Notes on rare or little-known Animals now or lately living in the Society's Gardens.—Part II. Birds. P. Z. S. 1871, pp. 489-496.

The most important relate to species of *Psittaci* and *Bucconidae* (q-v.).

TRISTRAM, H. B. Notes on some Passerine Birds, chiefly Palæarctic. Ibis, 1871, pp. 231-234.

Further notes on the Palæarctic species found in Alaska (Zool. Rec. vi. p. 47). [See also *Sylviidae*, *Motacillidae*, and *Fringillidae*.]

VAN BENEDEN, J. P. Les Oiseaux de l'Argile Rupelienne et du Crag. Bull. Ac. Belg. xxxii. pp. 213-219, pl.

The remains, which are very fragmentary, are referred to new species of *Rallidae*, *Scolopacidae*, *Charadriidae*, *Anatidae*, and *Laridae*.

* Although, thanks to the author, these papers have been for some time in my hands, the fourth volume of the 'Nederlandsch Tijdschrift' has not reached England; the real pagination, therefore, cannot be guaranteed.

PALÆARCTIC REGION.

- BETTONI, EUGENIO. *Storia Naturale degli Uccelli che nidificano in Lombardia ad illustrazione della raccolta ornitologica dei fratelli ERCOLE ed ERNESTO TURATI, con tavole litografate e colorate prese dal vero da O. DRESSLER.* Milano: 1871. Folio.

This fine work, which has been so often noticed (Zool. Rec. ii. p. 61, iv. p. 52, v. p. 39, vi. p. 31, vii. p. 22) is now finished by the publication of its forty-sixth part.)

- BORGGREVE, B. *Erster Nachtrag zu meiner Arbeit über "Die Vogel-Fauna von Norddeutschland."* J. f. O. 1871, pp. 210-224.

(Additional notes on the distribution of birds in North Germany, and reply to Capt. A. von Homeyer's criticism (Zool. Rec. vii. p. 20), who has a further rejoinder (J. f. O. 1871, p. 396).)

- BREHM, A. E. *Das Hochgebirge Scandinaviens und seine Vögel.* *Erinn. Vers. deutsch. Orn.* 1870, pp. 31-42.

(A popular account of the author's visit to Norway.)

- CABANIS, J. *Sibirische Vögel.* *Tom. cit.* pp. 43-45.

(A brief notice of recent investigations.)

- COLLETT, R. *Ornithologiske Bemærkninger til Norges Fauna.* N. Mag. Naturv. 1871, pp. 161-224.

(Based on observations made in the Trondhjem district.)

- . *Supplement til 'Norges Fugle og deres geographiske Udbredelse i Landet.'* Förh. Selsk. Chr. 1871, pp. 52-61.

(A few not unimportant additions to the author's former list (Zool. Rec. v. p. 39).)

- . *Stationäre und theilweis überwinternde Vögel Norwegens.* Ber. XVIII. Vers. d. o. G. 1870, pp. 46-51. Münster: 1871.

(A list of Norwegian birds, with remarks on the species wintering in the country.)

- DODE, C. *Exhibition of, and remarks upon, Animals from the Amoor and Turkestan.* P. Z. S. 1871, pp. 480, 481.

(Three new species, belonging to *Turdidæ* and *Fringillidæ* (2), noticed under names given them by Herr Severzow, who obtained them.)

- DODERLEIN, P. *Avifauna del Modenese e della Sicilia.* Palermo: 1870-71. Fasc. i.-iii. Roy. 8vo, pp. 1-172.

(An acceptable account of the birds of the two districts.)

- DRESSER, H. E. [See SHARPE, R. B.]

- DUBOIS, A. *Conspectus systematicus et geographicus Avium Europæarum.* Bruxellis: 1871. Roy. 8vo, pp. 35.

(The list includes the names of 575 species, the geographical range of which is in each case briefly indicated.)

+ FRAUENFELD, G. VON. [See "GENERAL SUBJECT."]

/ FRITSCH, A. Die Vögel Böhmens. J. f. O. 1871, pp. 161-205, 305-313, 378-392.

(The ornithology of the author's "Wirbelthiere Böhmens," reprinted from 'Arch. Landesdurchf. Böhm.,' including notes on 239 species of Bohemian birds.)

/ —. Naturgeschichte der Vögel Europa's. Prag: 1869-70. Folio with text in 8vo.

(This work (Zool. Rec. iv. p. 54) is now finished. The supplementary plates illustrate several species in plumage not hitherto figured.)

/ GOEBEL, H. Eine Reise von Petersburg nach Archangelsk über Twer, Jaroslaw, Wologda und Ustjug vom 8. Mai bis 1. Juni 1864. J. f. O. pp. 20-27.

Nothing of remarkable interest.

/ GOEBEL, H. Die in den Jahren 1867, 1868 und 1869 im Umanschen Kreise (Gouvernement Kiew) beobachteten Vögel. J. f. O. pp. 130-151.

(Concludes the list noticed last year (Zool. Rec. vii. p. 23), making 196 species observed.)

/ GOULD, J. The Birds of Great Britain. Parts xix., xx. London: 1871.

The species figured are named under the families to which they belong.

/ GRAY, ROBERT. The Birds of the West of Scotland, including the Outer Hebrides, with occasional records of occurrence of the rarer species throughout Scotland generally. Glasgow: 1871. 8vo, pp. 520.

A capital book, which was much wanted. It contains a great deal of interesting information.

/ GURNEY, J. H., Jun. On the Ornithology of Algeria. Ibis, 1871, pp. 68-86, 289-301, pl. iii.

(Notes on 141 species of birds observed by the author in 1870, preceded by a short bibliography of the subject. His more general observations are printed in 'Tr. Norw. Soc.' 1870-71, pp. 35-48.)

/ HANF, P. B. Ornithologische Miscellen. Verh. z.-b. Wien, xxi. pp. 87-98.

(Refers to Austrian birds. [Cf. TSCHUSI-SCHMIDHOFEN, V. VON.])

/ HEUGLIN, T. VON. Briefliches über eine Reise im europäischen Norden. J. f. O. 1871, pp. 10-13.

(On the birds observed on the Norwegian coast to Tromsö.)

- / HEUGLIN, T. VON. Die Vogel-Fauna im hohen Norden: Ornithologische Notizen aus Finmarken und Spitzbergen. *Tom. cit.* pp. 81-107. Nachtrag, pp. 205, 206.
(Observations made by the author, during his recent visit to a Spitsbergen, and others.)
- / HOLLAND, T. Die Wirbelthiere Pommerns, systematisch geordnet nebst Tabellen zur Bestimmung derselben nach der analytischen Methode. Stolp: 1871. 8vo, pp. 119.
(The ornithological portion is the model of a concise handbook, giving in 68 pages the characters of all the genera and of the 293 species included.)
- / HOMEYER, E. F. VON. Portugiesische Vögel. Erinner. Vers. deutsch. Orn. 1870, pp. 46-48.
(Describes a new species of *Sylvia*. *Phylloscopus borealis*.)
- / KOCH, GOTTLIEB VON. Synopsis der Vögel Deutschlands. Heidelberg: 1871.
This we have not seen.
- / LÜHDER, W. Notizen über den "Bock" bei Stralsund. J. f. O. 1871, pp. 300-305.
(Notes, chiefly on wild fowl.)
- / MARCHAND, A. Appendice au Catalogue des Oiseaux observés dans le département d'Eure-et-Loir. R. Z. 1870, p. 139.
(Adds 6 species) to the catalogue before noticed (Zool. Rec. 7. p. 42).
- / MÖBIUS, K. Ein Besuch der Insel Sylt im Mai 1871. Zool. Gart. 1871, pp. 193-196.
(Additions to his former paper (Zool. Rec. vii. p. 24).)
- / NEWTON, ALFRED. A History of British Birds. By the late WILLIAM YARRELL. Fourth edition. Revised. 8vo. Parts i., ii. London: 1871.
The editor attempts to bring this well-known work up to the existing state of knowledge, without materially altering its scope or extent. In consequence, the text has to be virtually rewritten. The geographical distribution of each species has received much attention.
- / PELZELN, A. VON. Ein Beitrag zur ornithologischen Fauna der österreichisch-ungarischen Monarchie. Verh. z.-b. Wien, xxi. pp. 689-730.
This important contribution to European ornithology is chiefly based on the collection of Austrian birds in the Vienna Museum, of which it is in fact a catalogue, though much additional information is given from other sources.
1871. [VOL. VIII.]

- / REY, E. Die Ornis von Halle. Z. ges. Naturw. 1871, pp. 453-489.

Chiefly of local interest; but 253 species are noticed, and the dimensions of large series of eggs given.)

- / RUSSOW, V. Ornithologische Notizen. SB. Ges. Dorp. 23 Febr. 1870.

These are (on the increase of the fauna of Livonia, Esthonia, and Courland, the non-vocal notes of birds in pairing-time, the results of an ornithological journey in the Baltic provinces, and a list of the species observed in Matzal Bay.)

- / SALVADORI, T. Fauna d'Italia. Parte secunda. Uccelli. Milano: 1871. 8vo, fasc. 1, 2.

This book supplies a great want, as no comprehensive account of Italian birds has hitherto appeared. [The synonymy, and especially the provincial names of the birds, are carefully given, and their distribution in Italy and the adjacent islands is concisely stated.]

- / SAUNDERS, HOWARD. A list of the birds of Southern Spain. Ibis, 1871, pp. 54-68, 205-225, 384-402.

(After briefly recapitulating the literature of the subject, the author gives a list of all the 321 species believed by him to have occurred in Spain below lat. 40° N.)

- / SCHACHT, H. Unsere Höhlenbrüter. Zool. Gart. 1871, pp. 129-137, 175-183, 201-204.

(Notes on the German birds which breed in holes of trees)

- / SHARPE, R. B., & DRESSER, H. E. A History of the Birds of Europe, including all the species inhabiting the Western Palearctic Region. London: 1871. Pts. i.-ix. 4to. Col. pls.

(Nine parts were published during the year, containing the descriptions of 71 birds. Besides the actual record of each species in Europe, an account of the allied birds is added wherever practicable, so that in some instances a monographic sketch of an entire genus is given.)

- / —, —. On two undescribed species of European birds [*Picida* and *Parida*]. Ann. N. H. (4) viii. pp. 436, 437.

- / SHAW, R. Visits to High Tartary, Yârkand, and Kâshgar (formerly Chinese Tartary), and return journey over the Karakoram Pass. London: 1871. 8vo, pp. 486.

Beyond the mention made (p. 268) of some Pheasants (Zool. Rec. vii. p. 59) this contains no ornithological information.

- / SOUTHWELL, T. On the Ornithological Archæology of Norfolk. Tr. Norw. Soc. 1870-71, pp. 14-21.

(Extracts showing the former ornithological condition of the county.)

- / STEJNEGER, L. Ornithologische Notizen aus Meran, Süd-Tirol, während der Winter 1869-70 und 1870-71. J. f. O. 1871, pp. 122-124. Nachtrag, pp. 462, 463.

(A list of 59 species) only locally interesting.

- / SUNDEVALL, C. J. Svenska Foglarna. Parts xxi., xxii. Stockholm: 1870-71. Oblong 4to.

(Continue the text to the middle of the *Grallæ*)

- / TSCHUSI-SCHMIDHOFEN, V. von. Die ornithologische Sammlung der k. k. zoologisch-botanischen Gesellschaft in Wien. Verh. z.-b. Wien, xxi. pp. 791-792.

(A brief sketch of the ornithological portion of the Society's museum.)

- / ——. Wanderungen im Böhmerwalde. J. f. O. 1871, pp. 62-73, 110-116.

[Field-notes] calling for no special remark.

- / ——. Ornithologisches Mittheilungen aus Oesterreich (1870). *Tom. cit.* pp. 116-119.

(A few notices of Austrian birds)

- / ——. Pfarrer Bl. HANF's ornithologische Sammlung in Mariahof. *Tom. cit.* pp. 119-121.

(A notice of this collection of Austrian birds.)

- / VOUGA, A. Oiseaux rares tués dans le canton et le bassin du lac de Neuchâtel. Bull. Soc. Neuch. ix. pp. 2, 3.

(Several rare species are mentioned.)

YARRELL, W. [See NEWTON, ALFRED.]

ETHIOPIAN REGION.

- / AYRES, T. Additional notes on Birds of the territory of the Transvaal Republic. Ibis, 1871, pp. 147-157, 253-270, pl. ix.

Contains (notes on 39 species, to which Mr. Gurney adds some editorial remarks)

- / BALL, V. Exhibition of Birds captured in the Red and Arabian Seas. P. As. Soc. Beng. 1871, pp. 249, 250.

- / BOCAGE, J. V. BARBOZA DU. Aves das possessões portuguezas da Africa occidental. Quinta lista. Jorn. Sc. Lisb. iii. pp. 333, 334.

(An account of further [Zool. Rec. iv. p. 58, v. p. 44, vii. p. 26]

AYES.
(*Grallus gutturalis*)

collections made at Mossamedes, and of some from Angola, noticing 77 species, of which one (*Turdidae*) is new.)

- ✓ BOCAGE, J. V. BARBOSA DU. Mammiferos e Aves do "Transvaal" offerecidos ao Museu de Lisboa pelo sr. F. Vanzeller. *Tom. cit.* pp. 345, 346.

(The birds are only 10 in number.)

- ✓ DOHRN, H. Beiträge zur Ornithologie der capverdischen Inseln. J. f. O. 1871, pp. 1-10.

(A list of the 21 species observed in these islands by the author, who questions the identifications made by Mr. Keulemans (Zool. Rec. iii. p. 54) on the same occasion. A species of *Sylviidae* is now first described, though already mentioned by Mr. Keulemans (N. T. D. iii. p. 368). No notice is taken of *Gypohierax angolensis* (cf. P. Z. S. 1869, p. 46).)

- ✓ DU CHAILLU, PAUL. My Apingi Kingdom, with life in the Great Sahara, and sketches of the chase of the Ostrich, Hyena, &c. London: 1871. Sm. 8vo, pp. 254.

(Contains a few notes on African birds.)

- GURNEY, J. H. Remarks on certain species of Abyssinian Birds. P. Z. S. 1871, pp. 147-149.

(Contains a few corrections of and additions to Dr. Finsch's paper (Zool. Rec. vii. p. 28), principally relating to *Accipitres*.)

- ✓ —. Letter from. Ibis, 1871, p. 103.

(Relates to species of *Cuculidae* [q.v.].)

—. [See also AYRES, T.]

- ✓ HEUGLIN, M. T. VON. Ornithologie Nordost-Afrika's, der Nilquellen- und Küsten-Gebiete des Rothen Meeres und des nördlichen Somal-Landes. Lieferungen 18-23. Cassel: 1871. Imp. 8vo, pp. 627-851, pls. xviii., xxxiii., xiv.

(These six parts complete the first volume of the work (Zool. Rec. vii. p. 28), which ends with *Columbidae*. Two species of *Picidae* are described as new. *P. mellanochlorus* & *P. (P.) albus*.)

- ✓ LAYARD, E. L. Letter from. Ibis, 1871, pp. 103-107.

(Mentions the birds seen on a voyage from the Cape of Good Hope to England.)

- ✓ —. Notes on South-African Ornithology. *Tom. cit.* pp. 225-230.

Contains a good deal of matter, (supplementary to his former publications (Zool. Rec. vi. p. 40)). (A new species of *Capitonidae* is described. *Barkalula* & *toni*.)

- ✓ MELLISS, J. C. Letter from. *Tom. cit.* pp. 367-370.

(On birds introduced into the island of St. Helena.)

/ SHARPE, R. B. Catalogue of African Birds in the collection of. London: 1870. 8vo, pp. 76.

(An enumeration of 703 species of African *Picariæ* (including *Psittaci*) and *Passeres*. Several identifications are made, and three new species (*Turdidæ*, *Timaliidae*, *Ploceidae*) indicated.)

/ —. On the Birds of Angola.—Part III. P. Z. S. 1871, pp. 130–135, pl. vii.

In continuation of former papers (Zool. Rec. vi. p. 41, vii. p. 29): 21 species, collected by Messrs. Monteiro and C. Hamilton, are here mentioned. A synopsis of the African *Pycnonoti* [*Turdidæ*] is given, and a new species of *Ploceidae* described. *Pycnonotus*

/ —. Contributions to the Ornithology of Madagascar.—Part II. *Tom. cit.* pp. 313–320, pl. xxxii.

(Describes a second collection formed by Mr. Crossley (Zool. Rec. vii. p. 29). A new species of *Cypselidæ* is described, and several identifications are made. *Cypselus gracilis*)

/ —. On the Birds of Cameroons, Western Africa. *Tom. cit.* pp. 602–615, pl. xlviii.

(Enumerates 62 species, collected by Mr. Crossley; and a list of all those hitherto recorded from Cameroons is added. One species of *Turdidæ* is new described & figured (Turdus Crossleyi).)

/ —. Descriptions of two new species [*Strigidæ* and *Fringillidæ*] of African Birds. *Ibis*, 1871, pp. 100–102. *Scotophila ussuriensis*

/ —. On seven new or lately described species [*Strigidæ*, *Upupidæ*, *Caprimulgidæ*, *Laniidæ*, *Muscicapidæ*, *Turdidæ*, and *Paridæ*] of African Birds. *Tom. cit.* pp. 414–417, pl. xii.

/ —. Notes on some African Birds [*Muscicapidæ* and *Fringillidæ*]. *Ann. N. H.* (4) viii. pp. 234–237.

—. On the *Coraciidæ* [q. v.] of the Ethiopian Region.

/ SHELLEY, G. E. Contributions to the Ornithology of Egypt. *Ibis*, 1871, pp. 38–54, 131–147, 309–319.

(This paper contains the results of the author's two visits to Egypt, the species which he thinks may fairly be reckoned Egyptian being added, to the number of 236.)

INDIAN REGION.

ANDERSON, A. Notes on the Raptorial Birds of India. [See "ACCIPITRES."]

/ ANDERSON, JOHN. A Report on the Expedition to Western Yunnan *vid* Bhamô. Calcutta: 1871. Royal 8vo, pp. 458.

(Contains a few notes on the birds obtained during the journey,

all of which are duly entered in the index.) The new species are described in the next paper.

- ✓ ANDERSON, JOHN. On eight new species of Birds from Western Yunan, China. P. Z. S. 1871, pp. 211–215, pl. xi.
(Two of these have been before noticed (Zool. Rec. vii. pp. 51, 59); the others belong to *Turdidæ*, *Sylviidæ* (3), *Fringillidæ*, and *Tetraonidæ*.)
- ✓ BALL, V. Brief notes on the Geology and on the Fauna in the neighbourhood of Nancowry Harbour, Nicobar Islands, J. A. S. B. 1870, pp. 25–34.
(None of the 21 species mentioned are new; but many of those described by Mr. Blyth, and hitherto almost unknown, are again brought to light.)
- ✓ —. Notes on Birds observed in the neighbourhood of Port Blair, Andaman Islands, during the month of August 1869. *Tom. cit.* p. 240.
(Of the 22 species mentioned, two are undetermined) but the rest are known.
- ✓ —. Names of Birds &c. in four of the aboriginal languages of Western Bengal. J. A. S. B. 1871, pp. 103–107.
- ✓ BLANFORD, W. T. Notes on a collection of Birds from Sikkim. P. As. Soc. Beng. 1871, pp. 215, 216.
(An abstract only of the paper; but the new species [*Sylviidæ*, *Timaliidæ*, and *Fringillidæ*] are fully described.)
- ✓ —. Note on Colonel M'Master's List of Birds from Nagpore &c. (*vide infra*). J. A. S. B. 1871, pp. 216, 217.
(Calls attention to isolated Malayan forms on certain hills in Indig.)
- ✓ —. List of Birds collected or observed in the Wardha Valley and its vicinity, near Chánda. *Tom. cit.* pp. 268–277.
Important, as [bearing on the geographical distribution of birds in India] a subject to which the author has paid much attention.
- ✓ —. Account of a visit to the eastern and northern frontiers of Independent Sikkim, with notes on the Zoology of the Alpine and Subalpine Regions.—Part I. *Tom. cit.* pp. 367–420.
[A narrative of the author's journey, performed with Capt. Elwes in 1870, and teeming with notes on the birds seen, of which a further account is promised.]
- ✓ BROOKS, W. E. Notes on the Ornithology of Cashmir. P. As. Soc. Beng. 1871, pp. 209, 210.
(The new species described are mentioned under the heads of their respective families (*Certhiidæ*, *Sittidæ*, *Sylviidæ*, *Motacilidæ*, *Alaudidæ*).]

/ DAVID, ARMAND. Catalogue des Oiseaux de Chine observés dans la partie septentrionale de l'Empire (au nord du Fleuve-bleu) de 1862 à 1870. N. Arch. Mus. vii. Bull. pp. 1-14.

(A brief notice of 470 species, of which only 4, belonging to *Timaliidae*, *Paridae*, and *Fringillidae*, are new—but important as a catalogue.

/ —. On two new species of Birds [*Turdidae*, *Sylviidae*] from Moupin, Western Szechuen. Ann. N. H. (4) vii. p. 256.

/ GOULD, J. The Birds of Asia. Part xxiii. London: 1870.

The species figured are mentioned under the families to which they belong.

/ HUME, A. O. Stray notes on Ornithology in India. Ibis, 1871, pp. 23-38, pp. 403-413.

(These refer to former papers (Zool. Rec. vi. p. 42, vii. p. 30), but contain also M. Verreaux's opinion on the birds therein mentioned. Several species are added to the Indian list, and several, belonging to *Falconidae*, *Caprimulgidae*, *Turdidae*, *Sylviidae*, *Alaudidae*, and *Sturnidae*, are described as new, most of the novelties having been obtained on Dr. Henderson's expedition to Yarkand.)

/ JERDON, T. C. Supplementary notes to the 'Birds of India.' Tom. cit. pp. 234-247, 335-356, pl. x.

(Many species are added to the avifauna of peninsular India; and the observations are extended to the birds of Assam and the districts adjacent as far as Chittagong.)

/ M'MASTER, A. C. Notes on Birds observed in the neighbourhood of Nagpore and Kamptee (Central Provinces), Chikalda and Akola in Berar. J. A. S. B. 1871, pp. 207-215.

Contains good field-notes, the more interesting on account of the locality. [*Vide supra*, BLANFORD, W. T.]

/ PELZELN, A. VON. Ueber die durch Herrn Baron E. v. Ransonnet von der ostasiatischen Expedition eingesendeten Säugethiere und Vögel. Verh. z.-b. Wien, pp. 99-102.

(The birds collected were very few; but their localities are noted, as also the colour of the soft parts of many of them.)

/ SWINHOE, ROBERT. Zoological Notes of a Journey from Canton to Peking and Kalgan. P. Z. S. 1870, pp. 427-451.

(Contains numerous notes on Mammals (Zool. Rec. vii. p. 2) and Birds, with an account of Père David's museum at Peking, in which three or four new species of the latter were recognized (*Fringillidae*, *Anatidae*), while eight or nine others are more or less precisely indicated (*Falconidae*, *Strigidae*, *Cypselidae*, *Sylviidae*, *Paridae*, *Emberizidae*, *Fringillidae*, *Ciconiidae*, *Anatidae*.)

✓ SWINHOE, ROBERT. A revised Catalogue of the Birds of China and its islands, with descriptions of new species, references to former notes, and occasional remarks. P. Z. S. 1871, pp. 337-423.

(This catalogue [containing a revision of the author's numerous detached papers, and embodying the results of his own discoveries and those of Père David] supplies a great want. [The number of Chinese species is raised to 675, as against 454 in the former list (P. Z. S. 1863, pp. 259-339). The new genera and species described] will be found under *Falconidæ*, *Timaliidæ*, *Hirundinidæ*, *Turdidæ*, *Sylviidæ*, *Motacillidæ*, *Sittidæ*, *Paridæ*, and *Alaudidæ*.

/ —. On four new species of Asiatic Birds [*Turdidæ*, *Paridæ*, *Alaudidæ*]. Ann. N. H. (4) vii. p. 257.

(✓ VERREAUX, J. Note sur les espèces nouvelles d'Oiseaux recueillies par l'Abbé Armand David dans les montagnes du Thibet chinois. N. Arch. Mus. vi. Bull. pp. 33-40, pl. 3., vii. pp. 25-64.

(The first paper is but a slight sketch; the second gives full details of the remarkable discoveries made by this explorer. Many new species, belonging to *Picidæ*, *Timaliidæ*, *Muscicapidæ*, *Turdidæ*, *Sylviidæ*, *Troglodytidæ*, *Sittidæ*, *Paridæ*, *Fringillidæ*, and *Alaudidæ* are described.)

(✓ WALDEN, [ARTHUR HAY,] Viscount. Observations on Dr. Stoliczka's "Contributions to Malayan Ornithology." Ibis, 1871, pp. 158-177, pl. vi.

These excellent remarks not only do full justice to Dr. Stoliczka's paper (Zool. Rec. vii. p. 31), but further enhance its value by the careful identifications and corrections here given.

/ —. Descriptions of three new species of Asiatic Birds [*Meliphagidæ*, *Timaliidæ*, *Sylviidæ*]. Ann. N. H. (4) vii. pp. 240-242.

AUSTRALIAN REGION.

FINSCH, O. [See HARTLAUB, G.]

(✓ HARTLAUB, G., & FINSCH, O. On a Collection of Birds from Savai and Rarotonga Islands in the Pacific. P. Z. S. 1871, pp. 21-32, pl. ii.

Both localities are zoologically almost unknown. [From the first 13 species are described, one being the type of a new genus of *Rallidæ*; from the second 7, 3 of which (belonging to *Muscicapidæ*, *Sturnidæ*, and *Columbidæ*) are new.]

(✓ HILL, E. S. Lord Howe's Island. Sydney: 1870. 8vo.
Not seen by the Recorder. ([Cf. Ibis, 1871, p. 443.])

- ✓ HUTTON, F. W. Catalogue of the Birds of New Zealand, with diagnoses of the species. New Zealand: 1871. 8vo, pp. 85.

Intended chiefly for the use of colonists, and well adapted to that end, (a brief diagnosis of each of the 160 species included (one of which, belonging to *Campephagidæ*, is new) being inserted, as well as an analytical key to the families. A list of the species introduced is added, and finally some critical notes, giving the author's reasons for certain changes in nomenclature and so forth.)

- ✓ —. On the Nests and Eggs of some species of New-Zealand Birds. [See "OOLOGY."]

POTTS, T. H. On the Birds of New Zealand. [See "OOLOGY."]

- ✓ SCLATER, P. L. Remarks on the Avifauna of the Sandwich Islands. *Ibis*, 1871, pp. 356-362.

(Especially refers to Mr. Dole's paper (*Zool. Rec.* vii. p. 32), of which it contains some important corrections. The 15 Hawaiian species of *Passeres* admitted by the author belong, with one exception (a *Corvus*), to genera peculiar to the islands, and to the families *Muscicapidæ* and *Meliphagidæ*. Of the latter a new genus is proposed.)

SCHLEGEL, H. [See "GENERAL SUBJECT."]

- ✓ WALDEN, [ARTHUR HAY,] Viscount. On the Birds of Celebes. *P. Z. S.* 1871, pp. 329-337.

✓ The introductory but very important portion of a paper since published in the Zoological Society's 'Transactions.'

NEARCTIC REGION.

- ALLEN, J. A. On the Mammals and Winter Birds of East Florida. [See "GENERAL SUBJECT."]

- ✓ BRUHIN, T. A. Ueber Ankunft und Brütezeit einiger nordamerikanischen Zugvögel. *Zool. Gart.* 1871, pp. 10-18.

Notes calling for no particular remark.

- COUES, ELLIOTT. Notes on the natural history of Fort Macon, N. C., and vicinity. *P. Ac. Philad.* 1871, pp. 12-47.

Excellent field-notes, these on the *Grallæ* and *Anseres* being especially interesting.

- ✓ GRAYSON, A. J. On the Physical Geography and Natural History of the Tres Marias and of Socorro, off the western coast of Mexico. *P. Bost. Soc.* 7 June, 1871.

(Edited by Mr. Lawrence, the author having died of fever caught while exploring the Isabel Islands. Col. Grayson visited

the Tres Marias thrice, and Socorro, where he was wrecked, twice. A pleasing account of the natural features of both groups is given, followed in each case by a list of the birds. On the first, 52 species have been observed; and on the last, 14. Six (*Mniotiltidæ*, *Turdidæ*, *Troglodytidæ*, *Emberizidæ*, and *Columbidæ*) seem to be new; and varieties of two others (*Psittacidæ* and *Laridæ*) are mentioned*.

HARTING, J. E. Catalogue of an Arctic collection of Birds presented by Mr. John Barrow, F.R.S., to the University Museum at Oxford; with notes on the species. P. Z. S. 1871, pp. 110-123.

(Most of the specimens obtained during the various arctic expeditions between 1848 and 1855 came into Mr. Barrow's possession; and this paper shows that many species have a more northern range than was hitherto supposed.)

LAWRENCE, G. N. [See GRAYSON, A. J.]

LEWIS, E. J. The American Sportsman, containing hints to Sportsmen, notes on Shooting, and the Habits of the Game-birds. Philadelphia. 8vo, pp. 1-510.

More than half this book is devoted to birds; and some good notes will be found on many of the *Gallinæ*, *Grallæ*, and *Anseres*, which are nearly all described and figured.) +

ROSS, A. M. The Birds of Canada, with descriptions of their habits, food, nests, eggs, times of arrival and departure. Toronto: 1871. 16mo, pp. 132.

("The text is valueless; most of the illustrations are bad copies of Wilson's figures.")

TRIPPE, T. MARTIN. Notes on the Birds of Minnesota. P. Ess. Inst. vi. pp. 113-119.

(Enumerates 138 species, and gives field-notes on most of them.)

NEOTROPICAL REGION.

BELLO Y ESPINOSA. Zoologische Notizen aus Puerto Rico. Zool. Gart. 1871, pp. 348-351.

(Contains a list of birds, 63 in number, translated from the Spanish by Dr. E. von Martens.)

GUNDLACH, Dr. J. Neue Beiträge zur Ornithologie Cuba's. J. f. O. 1871, pp. 265-294, 353-378.

* Some, if not all, of these appear to have been described in the tenth volume of 'Ann. Lyc. N. York,' which the Recorder has not seen. He has only been able to notice the above-mentioned important paper through the courtesy of Mr. Lawrence, as the Boston 'Proceedings' have not yet been distributed in this country.—Ed.

(The beginning of a very complete account of the birds of Cuba, where the author resided for 30 years. A critical review of the works hitherto written on the ornithology of the island forms an appropriate introduction; and the essay, so far as published, takes us to the end of *Accipitres*.)

HAMILTON, J. F. Notes on Birds from the Province of São Paulo, Brazil. *Ibis*, 1871, pp. 301-309.
(Short notes on the habits of nearly 45 species.)

HUDSON, W. H. Letters on the Ornithology of Buenos Ayres. P. Z. S. 1871, pp. 4-7, 258-262, 326-329.
Good (notes on some little-known species (cf. *Zool. Rec.* vii. p. 34).)

LAWRENCE, G. N. Descriptions of three new species of American Birds [*Tyrannidæ*, *Turdidæ*, *Tanagridæ*], with a note on *Eugenes spectabilis*. *Ann. Lyc. N. Y.* x. pp. 137-140.

NATION, W. [See SCLATER, P. L.]

SALVIN, OSBERT. On the *Psittacidæ* [q. v.] of Central America. *Ibis*, 1871, pp. 86-100, pl. iv.

As an able contribution to zoogeography this must be mentioned here.

——. [See also SCLATER, P. L.]

SCLATER, P. L. On the Land-birds of Juan Fernandez. *Ibis*, 1871, pp. 178-183, pl. vii.

(Only six species known, which are either identical with or near representatives of Chilean forms; and the islands of the group must have been colonized from Chili) (see *Trochilidæ*, *Dendrocopitidæ*, and *Tyrannidæ*).

——. On the Birds of the island of Santa Lucia, West Indies. P. Z. S. 1871, pp. 263-273, pl. xxi.

(After a good review of the ornithological literature of the Lesser Antilles, the author describes a collection made by Mr. Semper in St. Lucia, and containing 25 species, one of which is new (*Icteridæ*).

——. On the Birds of the vicinity of Lima, Peru. With notes on their habits, by Professor W. NATION, of Lima. (Part IV.) *Tom. cit.* pp. 496-498.

(In continuation of former papers (*Zool. Rec.* vi. pp. 51, 52). Only 5 species mentioned, one of which is new (*Tyrannidæ*).)

——. Remarks on a Collection of Birds from Oyapok. *Tom. cit.* pp. 749, 750.

(Records a few birds new to the locality, and gives a synopsis

of the genus *Ochthoeca* (*Tyrannidæ*), with the description of a new species, and a new species of *Heteropelma* (*Cotingidæ*).

/ SUNDEVALL, C. J. On Birds from the Galapagos Islands. *Tom. cit.* pp. 124-130.

A list of 26 species, of which two are new (*Ardeidæ*, *Spheniscidæ*), obtained by the Swedish 'Eugenie' expedition in 1852. Remarks on the species allied to some of those recorded are added. Some are noticed from the Galapagos for the first time.)

/ WYATT, CLAUDE W. Notes on some of the Birds of the United States of Columbia. *Ibis*, 1871, pp. 113-131, 319-325, 373-384, pl. v.

(Gives good notes on 210 species, some of them very rare, their names being determined by Messrs. Salvin and Selater. A map of the route traversed by the author, and a well-written account of his journey, are prefixed.)

ANATOMY AND PHYSIOLOGY.

COLLETT, R. On the asymmetry of the Skull in *Strix tengmalmi*. *P. Z. S.* 1871, pp. 739-743, figs. [See *Strigidæ*.]

/ COUES, E. Mechanism of Flexion and Extension in Birds' Wings. *Am. Nat.* v. pp. 513, 514.

(Abstract of a paper read at the Indianapolis meeting of the American Association for the Advancement of Science. Flexion of the forearm upon the humerus produces flexion of the hand upon the forearm by osseous mechanism alone, and extension of the forearm causes extension of the hand. In either movement the radius slides lengthways along the ulna.)

/ CUNNINGHAM, R. O. Notes on some points in the osteology of *Rhea americana* and *R. darwini*. *P. Z. S.* 1871, pp. 105-110, pls. vi., vi^a. [See *Rheidæ*.] /

/ FLOWER, W. H. On the Skeleton of the Australian Cassowary (*Casuaris australis*). *Tom. cit.* pp. 32-35. [See *Casuariidæ*.] /

/ GEGENBAUR, C. Beiträge zur Kenntniss des Beckens der Vögel. *Jen. Z. Nat.* vi. pp. 158-220, Taf. v., vi., vii.

An important work [on the pelvis of birds, the structure of which in various genera is figured.]

/ KOSSMANN, R. Ueber die Talgdrüsen der Vögel. *Z. wiss. Nat.* 1871, pp. 568-599, pls. xliii., xlv.

(After a summary of the literature of the subject and a comparison of the corresponding structures in Mammals, a sufficiently

detailed account of the form, relations, minute anatomy, functions and development of the oil-gland in Birds is given.)

/ LEWIS, GRACE ANNA. Symmetrical Figures in Birds' Feathers. Am. Nat. v. pp. 675-678, figs.

(On the form of certain granules contained in feathers examined under the microscope.)

/ LÜHDER, W. Zur Bildung des Brustbeins und Schultengürtels der Vögel. J. f. O. 1871, pp. 321-353.

The aim of this essay is to aid the search for a "Natural System" of ornithology; but it is rather wanting in practical results, though the varied structure of the sternal apparatus is carefully traced through the principal groups of birds.)

/ MARSHALL, W. Sur les plumes caudales allongées des Oiseaux de Paradis. Arch. Néerl. vi. pp. 296-304. [See "*Paradisidae*."]

MILNE-EDWARDS, A. Recherches Anatomiques, etc. [See "GENERAL SUBJECT."]

/ MORSE, E. S. On the Carpal and Tarsal Bones of Birds. Am. Nat. v. pp. 524, 525.

(Abstract of a paper read at the late meeting of the American Association. In the embryos of several birds the author has found three distinct tarsal bones, two proximal, answering to the tibia and fibula, and a distal one. The first two ankylose early, and then unite with the tibia, the third with the metatarsal. In the carpus he had found generally four ossicles (but in two species five), the distal ones uniting with the middle and outer metacarpals, the others remaining free.)

/ MURIE, J. On the Sternum and Viscera of Pell's [*sic*] Owl (*Scotopelia peli*, Temm.). [See *Strigidae*.]

/ —. On the Dermal and Visceral Structures of the Kagu, Sun-Bittern, and Boatbill. Tr. Z. S. vii. pp. 465-492, pls. lvi., lvii.

(*Cancroma* has only one cæcum, like the other *Ardeidae*; *Eurypyga* and *Rhinocetus* have two cæca.)

/ —. Additional Notice concerning the Powder-Downs of *Rhinocetus jubatus*. P. Z. S. 1871, pp. 647, 648.

(On the nomenclature to be used for the various "patches" of powder-down.)

/ NEWTON, ALFRED. On a remarkable Sexual Peculiarity in an Australian species of Duck. P. Z. S. 1871, pp. 649-651, figs. [See *Anatidae*.]

/ OWEN, R. On *Dinornis*.—(Part XI.): containing a description

of the Integument of the Sole, and Tendons of a Toe, of the Foot of *Dinornis robustus*, Ow. Trans. Z. S. vi. pp. 495, 496, pl. 88.—(Part XII.): containing a description of the Femur, Tibia, and Metatarsus of *Dinornis maximus*, Ow. *Tom. cit.* pp. 497–500, pls. 89, 90.—(Part XIII.): containing a description of the Sternum in *Dinornis elephantopus* and *D. rheides*, with notes on that bone in *D. crassus* and *D. casuarinus*. *Op. cit.* vii. pp. 115–122, pls. 7–9.—(Part XIV.): containing Contributions to the Craniology of the Genus, with a description of the Fossil Cranium of *Dasornis londinensis*, Ow., from the London Clay of Sheppey. *Tom. cit.* pp. 123–150, pls. 10–16.—(Part XV.): containing a description of the Skull, Femur, Tibia, Fibula, and Metatarsus of *Aptornis defossor*, Owen, from near Oamaru, Middle Island, New Zealand; with additional observations on *Aptornis otidiformis*, on *Notornis mantelli*, and on *Dinornis curtus*. *Tom. cit.* pp. 353–380, pls. 40–44.—(Part XVI.): containing notices of the Internal Organs of some Species, with a description of the Brain and some Nerves and Muscles of the Head of the *Apteryx australis*. *Tom. cit.* pp. 381–396, pls. 45–47.)

The comprehensive titles of these valuable papers sufficiently indicate the varied subjects treated. The whole are in continuation of the series before mentioned (Zool. Rec. iv. p. 73).

- ✓ REICHENOW, ANTON. Die Fussbildungen der Vögel. J. f. O. 1871, pp. 401–458, Taf. vi.

The different form of birds' feet is well treated, and the scutellation of the tarsus in various groups illustrated; (but the author's generalization, that in the foot lies the explanation of a bird's "life-function," will hardly be accepted by all ornithologists. *with*

- ✓ REINHARDT, J. Om en hidtil ukjendt Knogle i Hovedskallen hos Turakoerne (*Musophagides*, Sundev.) med nogle Bemærkninger om de lignende Knogler hos andre Fuglefamilier. Vid. Medd. 1871, pp. 326–341, tab. vii.

(The *os uncinatum* shown by Dr. Magnus (*cf.* Zool. Rec. vii. p. 36) to exist in *Phœnicophæus* is identical with the *ossiculum lacrymo-palatinum* found by Prof. Brandt in *Fregata* and certain *Procellariidæ*, and is present in the *Musophagidæ*, *Trogonidæ*, and some other *Cuculidæ*. It probably assists the apparatus of smell.)

- ✓ PETTIGREW, J. B. On the Physiology of Wings; being an analysis of the movements by which Flight is produced in the Insect, Bat, and Bird. Pr. Soc. Edinb. vii. pp. 336–350.

(An abstract only of the paper.)

- / SHARPE, R. B. On the *Coraciidæ* of the Ethiopian Region. Ibis, 1871, pp. 184–203, 270–289, pl. viii.

(Figures the skull, foot, and part of the sternum of *Coracias* and *Atelornis* as well as the auxiliary plume of the body-feathers in each genus of the family.)

- / VERREAUX, J. P. On the Colouring-matter of the Wing-feathers of certain Touracoes. P. Z. S. 1871, pp. 40, 41.

(Among certain *Musophagidæ* heavy rain washes the crimson colouring-matter (cf. Zool. Rec. v. p. 73) out of the feathers; but this, in the living bird, is restored as they dry. The same is observable in the breast-feathers of some *Trogonidæ*.)

- / YOUNG, J. Contributions to the Anatomy of the Shoulder of Birds. J. Anat. Phys. vi. pp. 76–81.

(Describes muscles which work the wing, with special notes referring to the flight of various birds.)

NEOSSOLOGY.

- BETTONI, E. Storia Naturale degli Uccelli che nidificano in Lombardia &c. [See "PALÆARCTIC REGION."]

(The young of *Regulus cristatus*, *Cygnus olor*, *Anser cinereus*, *Cairina moschata*, *Montifringilla nivalis*, and *Tetrao urogallus* are figured.)

- / MARCHAND, A. Notes sur les Poussins des Oiseaux d'Europe. R. Z. 1870, pp. 225–229, 240–249, 257–266, 273–282, 288–302, 304–313.

(The letterpress to the series of plates before mentioned (Zool. Rec. i. p. 62, ii. p. 88, iii. p. 70, iv. p. 76, v. p. 61, vi. p. 56, vii. p. 37). The following nestlings are also figured:—*Circus rufus*, *C. cineraceus*, *Strix otus*, *Totanus macularius*, *Uria troile*, *Anas strepera*, *Podiceps cristatus*, *P. cornutus*, *P. auritus*, *P. rubricollis*, *Vanellus gregarius*, *Machetes pugnax*.)

OOLOGY.

- / BETTONI, E. Storia Naturale degli Uccelli che nidificano in Lombardia &c. [See "PALÆARCTIC REGION."]

(Plate vii. figures the eggs of *Gavia ridibunda*, *Tetrao urogallus*, *Scolopax rusticola*, *Perdix saxatilis*, *Cygnus olor*, *Gallinula chloropus*, *Phyllopus rufa*, *P. bonellii*, *Ægithalus pendulinus*, *Regulus cristatus*, *Rubecula familiaris*, *Montifringilla nivalis*, *Sylvia cinerea*, *Alauda arborea*, *A. arvensis*, *Cuculus canorus*, *Bubo maximus*, and *Edicnemus crepitans*.)

- / DRESSER, H. E. Exhibition of and remarks on some European Birds' Eggs. P. Z. S. 1871, pp. 102–104.

(Refers to *Micronisus brevipes*, *Motacilla citreola*, *Turdus fuscatus*, *Reguloides superciliosus*, and *Ruticilla aurea*.)

- / HOCKER, J. Ueber die verschiedene Färbung der Eier von *Lanius minor*. J. f. O. 1871, p. 464.

(The variation in colour, as in other species of the genus, depends on the age of the female parent.)

- † HUTTON, F. W. On the Nests and Eggs of some species of New-Zealand Birds not previously described. Tr. N.-Z. Inst. iii. pp. 111, 112.

(The species noticed are *Creadion carunculatus*, *Rallus pectoralis*, *Majaqueus parkinsoni*, *Graculus varius*, and *Sula serrator*.)

- NATHUSIUS, W. VON. Die Structur des Vogel-Eies und deren Beziehungen zur Systematik. J. f. O. 1871, pp. 241-260.

(In continuation of papers before noticed (Zool. Rec. vi. p. 57). The author considers that some natural families of birds are marked by certain well-defined characters of the egg-shell, and that by the structure of this alone a species can be unfailingly referred to these groups.)

- Ueber die Eischalen von *Æpyornis*, *Dinornis*, *Apteryx* und einigen *Crypturiden*. Z. wiss. Zool. 1871, pp. 330-355, pls. xxv., xxvi.

(The structure of the egg-shell confirms the place of *Æpyornis* and *Dinornis* [cf. Zool. Rec. vi. p. 57] among the *Struthioncs*, and the affinity of *Apteryx* to the *Tinamidæ* and certain *Grallæ*, the last two being also allied by the same character, which serves to separate them from the normal *Gallinæ*.)

- NEWTON, ALFRED. On some New or Rare Birds' Eggs. P. Z. S. 1871, pp. 55-58, pl. iv.

P. Z. S. 1871

(The eggs of *Theristicus melanopis*, *Calidris arenaria* [cf. *etiam tom. cit.* pp. 546, 547], *Numenius borealis*, *N. hudsonicus*, *Chionis minor*, *Xema sabini*, *Chroicocephalus philadelphia*, *Larus franklini* are figured, and those of *Leucosticte griseinucha*, *Macrorhamphus griseus*, *Actodromas bairdi*, *Clangula albeola*, *Somateria v-nigrum*, and *Chen hyperboreus* described.)

- POTTS, T. H. On the Birds of New Zealand.—Part II. Tr. N. Z. Inst. iii. pp. 59-109, pls. vi.-xii.

(In continuation of a former paper (Zool. Rec. vii. p. 38), giving an account of the breeding-habits of 30 species, the nests of several being figured.)

- Notes on an Egg of *Alca impennis*, Linn., in the collection of the writer. *Id. tom. cit.* pp. 109, 110.

- REY, E. Ueber Kuckukseier. J. f. O. 1871, pp. 225-228.

(A list giving details of 65 eggs of *Cuculus canorus*, with reference to the theory of assimilation.)

- Jugendkleider und Eier einiger Vögel aus Klein-Asien. *Tom. cit.* pp. 459-462.

(Eggs of *Sitta krueperi*, *Picus syriacus*, *Oxylophus glandarius*, *Garrulus melanocephalus* are described.)

- WAHLGREN, F. Ein Ei im Eie. J. f. O. 1871, pp. 260-265.

(Describes three kinds of this anomaly.)

ACCIPITRES.

ANDERSON, A. Notes on the Raptorial Birds of India. P. Z. S. 1871 pp. 675-690.

(Treats of 18 species of diurnal *Accipitres*.)

CATHARTIDÆ.

(*Sarcorhamphus gryphus*, its habits. Two races indicated. J. Orton, Ann. N. H. (4) viii. pp. 185-192.)

VULTURIDÆ.

Gypætus alpinus, monograph of the species. A. Girtanner, Verh. St. Gall. Ges. 1869-70, pp. 147-244; Zool. Gart. 1871, pp. 241-247. Its fossil remains figured, A. Milne-Edwards, Ois. Foss. Fr. pl. 188, figs. 1-8.

Gyps fulvescens (Zool. Rec. v. p. 60) is apparently *G. fulvus*, juv.; but *G. himalayensis* (loc. cit.) may be a good species. T. C. Jerdon, Ibis, 1871, p. 235.

FALCONIDÆ.

Aquila imperialis, *A. naevioides*, and their allies. A. Alléon & J. Vian, R. Z. 1870, pp. 81-86, 129-138; H. Saunders, P. Z. S. 1871, pp. 37-39; A. Anderson, tom. cit. pp. 682-690; J. H. Gurney, Ibis, 1871, pp. 247, 248.

Aquila amurensis, sp. n., from the Amoor, like *A. clanga*, but larger. R. Swinhoe, P. Z. S. 1871, p. 338.

Palæohierax (gen. nov.) *gervaisi*, *Palæocircus* (gen. nov.) *cuvieri*, *Aquila deprædator*, *A. prisca*, *A. minuta* and *Haliaeetus piscator*, their fossil remains figured. A. Milne-Edwards, Ois. Foss. Fr. pl. 183, figs. 1-16, pl. 184, figs. 1-13, pl. 185, figs. 5-11, 16, pl. 186, figs. 7-12.

Haliaeetus brooksi (Zool. Rec. vii. p. 39) is probably *H. albicilla*, juv., and new to India. T. C. Jerdon, Ibis, 1871, p. 336.

Haliaeetus albicilla in Egypt. J. H. Gurney, tom. cit. p. 247.

Buteo fuliginosus, Hume (Zool. Rec. vi. p. 60) (*nec* Sci. Tr. Z. S. iv. p. 267), is *B. ferox*. A. Hume, tom. cit. p. 25.

Buteo desertorum in Thuringia. O. von Krieger, J. f. O. 1871, p. 109.

Buteo erythronotus in Juan Fernandez. P. L. Sclater, Ibis, 1870, p. 182.

Buteo cinereus, *Milvus deperditus* and *M. regalis*, their fossil remains figured. A. Milne-Edwards, Ois. Foss. Fr. pl. 187, figs. 8-11, pl. 185, figs. 1-4, pl. 187, figs. 16, 17.

Milvus affinis in India. T. C. Jerdon, Ibis, 1871, p. 343.

Stringonyx andersoni distinct from *Machærhamphus alcinus* (cf. Zool. Rec. ii. p. 92, iii. p. 73, iv. p. 81). R. B. Sharpe, P. Z. S. 1871, pp. 500-502.

"*Teracus* [gen. nov.] *littoralis*, Aymard," and *Falco tinnunculus*, their fossil remains figured. A. Milne-Edwards, Ois. Foss. Fr. pl. 185, figs. 20-23, pl. 187, figs. 1-7.

Falco candicans, *F. islandus*, and *F. gyrfalco*, the three forms differentiated. A. Newton, Yarr. Br. B. ed. 4, i. pp. 36-52; P. Ac. Philad. 1871, p. 94.

HOMER, E. F. VON. Monographische Beiträge.—I. *Gemmaja* und *Falco*. J. f. O. 1871, pp. 39-56.

(On the synonymy of the birds of these groups.)

Falco peregrinus in America. W. Wood, Am. Nat. v. pp. 80-87. 1871. [VOL. VIII.]

Falco atriceps (Zool. Rec. vi. p. 60), *F. babylonicus*, and their allies, notes on. A. O. Hume, Ibis, 1871, p. 24; E. Delmé-Radcliffe, *tom. cit.* pp. 363-366.

Falco hendersoni, sp. n., from Yarkand: A. O. Hume, *tom. cit.* p. 407. Probably *F. milvipes*, Hodgson: O. Salvin, *loc. cit.*

Falco barbarus in Spain. H. Saunders, *tom. cit.* p. 58.

Falco cenchris, var. *pekinensis*, from North China: R. Swinhoe, P. Z. S. 1870, p. 442. As *Tichornis pekinensis*, sp. n., and from India also: *Id. op. cit.* 1871, p. 341.

Falco vespertinus, *F. tinnunculus*, *F. cenchris*, and *F. subbuteo* figured, and the dark Madeiran race of the second noticed. R. B. Sharpe & H. E. Dresser, B. Eur. pts. i.-iv.

Erythropus amurenensis in the Matabili country. E. L. Layard, *tom. cit.* p. 227.

Polihierax insignis, sp. n., from Tongoo, in Upper Burma. Ld. Walden, P. Z. S. 1871, pp. 627, 628.

Hierax, the species of. *Id.* Ibis, 1871, p. 161.

Hierax melanoleucus in Cachar. T. C. Jerdon, *tom. cit.* p. 243.

Astur novæ-hollandiæ (stirps alb.) from New Guinea smaller than Australian specimens. N. Schlegel, N. T. D. iv. p. 34.

Accipiter melanoschistus (Zool. Rec. vi. p. 61), notes on. A. O. Hume, Ibis, 1871, p. 25; R. B. Sharpe & H. E. Dresser, B. Eur. pt. ix.

Accipiter nisus and *A. brevipes* figured, with a full account of the different forms of the first. R. B. Sharpe & H. E. Dresser, B. Eur. parts v., ix.

Accipiter hartlaubi, ♂ juv., described. R. B. Sharpe, P. Z. S. 1871, p. 613.

Micronisus brevipes, its egg. H. E. Dresser, *tom. cit.* p. 103.

Circus aeruginosus in South Africa. T. Ayres, Ibis, 1871, p. 147.

SERPENTARIIDÆ.

Serpentarius robustus, its fossil remains figured. A. Milne-Edwards, Ois. Foss. Fr. pl. 186, figs. 1-6.

STRIGIDÆ.

Ephialtes. The Indian species. T. C. Jerdon, Ibis, 1871, pp. 347, 348.

Ephialtes jerdoni (Zool. Rec. vii. p. 40) is *E. malabarica*, Jerdon (Madr. J. L. & S. xiii. p. 119). Ld. Walden, *tom. cit.* p. 112.

Glaucidium passerinum and *Athene noctua* figured. R. B. Sharpe & H. E. Dresser, B. Eur. pts. ii., iv.

Athene plumipes, sp. n., from North China. R. Swinhoe, P. Z. S. 1870, p. 448.

Noctua hoedti, sp. n., from Mysol and New Guinea. H. Schlegel, N. T. D. iv. pp. 3, 34.

Nyctala tengmalmi, the asymmetry of its skull: R. Collett, P. Z. S. 1871, pp. 739-743, figs. [cf. — Streets, P. Ac. Philad. 1870, p. 73]. In India: T. C. Jerdon, Ibis, 1871, p. 340.

Scotopelia peli, its anatomy. J. Murie, J. Anat. Phys. vi. pp. 76-81.

Scotopelia ussheri, sp. n., from Fantee. R. B. Sharpe, Ibis, 1871, pp. 101, 417, pl. xii.

Strix aluco is the type of the genus *Strix*, L. A. Newton, Yarr. Br. B. ed. 4, i. p. 146.

Syrnium nuchale (Zool. Rec. vii. p. 40), young described. R. B. Sharpe P. Z. S. 1871, p. 613.

Nyctea nivea in Pomerania, G. Kessler, J. f. O. 1871, p. 224; in India, A. O. Hume, Ibis, 1871, p. 410. Its fossil remains figured: A. Milne-Edwards, Ois. Foss. Fr. pls. 193, 194.

Bubo arvernensis, *B. poirrieri* and *Strix antiqua*, their fossil remains figured. *Id. op. cit.* pl. 192, figs. 3-29.

Strix flammea, its food. J. Jäckel, Zool. Gart. 1871, pp. 138-142.

PSITTACI.

FRIEDEL, E. Papageien in der englischen Vogelwelt. Zool. Gart. 1871, pp. 65-73, 118-125.

(Mr. Buxton's paper (Zool. Rec. v. p. 69) noticed.)

HALLEY, J. J. A Monograph of the *Psittacidae*, or Parrot-family of Australia. Ballarat: 1871. Part i. Fol.

(A popular work, with some original observations. *Ptilotophus galeritus*, *P. leadbeateri*, *Polytelis melanura*, and *P. barrabandi* are figured.)

SALVIN, OSBERT. On the *Psittacidae* of Central America. Ibis, 1871, pp. 86-100, pl. iv.

An excellent paper [The range of the 27 species (one of which is new) belonging to the country being well shown, and critical remarks on others assigned to it added. Comments on the article are made by Mr. Lawrence and Prof. Reinhardt (*tom. cit.* pp. 249-251, 362).]

PILICLOPHIDÆ.

Cacatua gymnopsis, sp. n., from South Australia, allied to *C. ducorpsi* (Zool. Rec. i. p. 68, iv. p. 86) and *C. sanguinea*. P. L. Slater, P. Z. S. 1871, pp. 490-493.

Nasitera pygmaea geelvinkiana, from the Bay of Geelvink, regarded as a race of *N. pygmaea*, as also *N. pusio* (Zool. Rec. ii. p. 94), which is called *N. pygmaea salomonensis*. H. Schlegel, N. T. D. iv. pp. 5-7.

ARIDÆ.

Conurus carolinensis in confinement. E. Rey, Zool. Gart. 1871, pp. 280-282.

Conurus æruginosus distinct from *C. pertinax* (cf. Zool. Rec. iv. p. 86). P. L. Slater, P. Z. S. 1871, p. 494.

Conurus finschi, sp. n., from Central America. O. Salvin, Ibis, 1871, p. 91, pl. iv.

"*Conurus holochlorus*, var. *brevipes*, Baird, Ann. Lyc. N. York, x. p. 14," from Socorro Island, off the west coast of Mexico. G. N. Lawrence, P. Bost. Soc. 7 June 1871.

Brotogeris subcærulea (Zool. Rec. v. p. 70) is probably *B. tovi*, var. O. Salvin, *tom. cit.* p. 94.

PSITTACIDÆ.

Psittacus verreauxi, its fossil remains figured. A. Milne-Edwards, Ois. Foss. Fr. pl. 200.

Psittacus erythacus, its habits. J. G. Keulemans, N. H. Cage Birds, pt. ii.

Psittacella, subgen. nov., allied to *Psittacula* and *Euphema*, established for

P. brehmi and *P. modesta*, spp. nn., from the northern peninsula of New Guinea. II. Schlegel, N. T. D. iv. pp. 35-37.

"*Nanodes musschenbroeki*, Rosenb.," sp. n., from the northern peninsula of New Guinea, allied to *N. placens* and *N. rubrinotatus*. *Id. tom. cit.* pp. 34, 35.

TRICHOGLOSSIDÆ.

Eclectus personatus and its allies. H. Schlegel, N. T. D. iv. pp. 4, 5.

Lorius papuensis, Less., and *Nestor pecqueti** in New Guinea. *Id. tom. cit.* pp. 37, 38.

Lorius tibialis, sp. n., probably from one of the Moluccas. P. L. Sclater, P. Z. S. 1871, p. 499, pl. xl.

Loriculus catanene and *L. aurantiifrons*, spp. nn., the first from Sanghir, the second from Mysol. II. Schlegel, N. T. D. iv. pp. 7-9.

Trichoglossus rosenbergi, sp. n., from Geelvink Bay, allied to *T. haematotus*. *Id. tom. cit.* pp. 9, 10.

Trichoglossus meyeri, sp. n., from Celebes, allied to *T. flavoviridis*. Ld. Walden, Ann. N. H. (4) viii. pp. 281, 282.

Trichoglossus mitchelli figured. P. L. Sclater, *tom. cit.* p. 499, pl. xli.

PICARIÆ.

PICIDÆ.

Dryocopus martius figured. J. Gould, B. Gr. Br. pt. xx.; R. B. Sharpe & H. E. Dresser, B. Eur. pt. iii.

Gecinus canus figured. *Id. op. cit.* pt. iv.

Picus major, *P. medius*, *P. leuconotus*, *P. numidicus*, and *P. syriacus* are figured. With the last *P. feliciae*, Malh., is identical. *Id. op. cit.* pts. v.-ix.

(*Picus lilfordi*), sp. n., from South-eastern Europe, like *P. leuconotus*, but having a crimson crown and a barred rump. *Id. Ann. N. H. (4) viii.* pp. 436, 437.

Picus (Dendrocopus) leucopterus, sp. n., from Central Asia, allied to *P. major*, but having more white on the wing. T. Salvadori, Atti Acc. Tor. vi. p. 129.

Picus melanauchen and *P. balius*, spp. nn., from N.E. Africa; the first allied to *P. habessinicus*, the second allied to *P. punctuligerus*. M. T. von Heuglin, Orn. N.-O. Afr. i. pp. 808, 810, 811.

Picus consobrinus and *P. archiaci*, their fossil remains figured. A. Milne-Edwards, Ois. Foss. Fr. pl. 176, figs. 1-7, pl. 178, figs. 1-5.

Picus desmursi and *Picoides funebris*, spp. nn., from Moupin. J. Verreaux, N. Arch. Mus. vi. Bull. p. 33, vii. p. 144.

Dendrobates striatus, sp. n.?, from the Bechuana country, allied to *D. brucei*, but having bolder and more elongated markings beneath. E. L. Layard, Ibis, 1871, p. 227.

Tiga "rufa" (sc. *javanensis*, Ljungh), *Muelleripicus feddeni*, and *Miglyptes*

* Mr. Garrod has lately shown (P. Z. S. 18 June, 1872) that *Nestor* differs in the structure of the tongue from the Trichoglossine group of *Psittaci*.—Ed.

marginatus (sc. *tukki*, Less.), critical notes on. Ld. Walden, *tom. cit.* pp. 163-165.

TROGONIDÆ.

Harpactes kasumba and its allies. Ld. Walden, *Ibis*, 1871, p. 161.

Hapaloderma narina. The red feathers lose their colour on being wetted, as is the case in the *Musophagidæ*. J. P. Verreaux, *P. Z. S.* 1871, p. 41.

Trogon gallicus, its fossil remains figured. A. Milne-Edwards, *Ois. Foss.* Fr. pl. 177, figs. 18-22.

CORACIIDÆ.

✓ SHARPE, R. B. On the *Coraciidæ* of the Ethiopian Region. *Ibis*, 1871, pp. 184-203, 270-289, pl. viii.

(Full descriptions, with the synonymy, are given of twelve species, which are divided into three subfamilies, and their osteological and pterological characters are shown in the plate. *Geobiasles* is proposed as a new genus, the type being *Brachypteracias squamigera*, Lafr. The geographical distribution of the group in Africa is shown in a table.)

✓ *Coracias garrula* figured. R. B. Sharpe & H. E. Dresser, *B. Eur.* pt. i.

Eurystomus waigiouensis, sp. n., from Waigiou, allied to *E. azureus* and *E. crassirostris* (*Zool. Rec.* vi. p. 63). D. G. Elliot, *Ibis*, 1871, pp. 203, 204.

MEROPIDÆ.

✓ *Merops forsteni*, note on. A. B. Meyer, *J. f. O.* 1871, pp. 232, 233.

ALCEDINIDÆ.

✓ SHARPE, R. B. A monograph of the *Alcedinidæ* or Kingfishers. London. Parts xiv., xv. Roy. 8vo.

(These conclude the author's part of the work, and contain an introductory treatise, giving a full account of the classification, geographical distribution, and literature of the family. The species figured are *Ceryle rudis*, *Alcyon affinis* and *A. lessoni*, *Pelargopsis fraseri* and *P. malaccensis*, *Ispidina lecontei*, *Halcyon lindsayi*, *H. hombroni*, *H. albicilla*, *H. vagans*, *H. julie*, and *H. leucopygia*, *Tanysiptera nais*, *T. galatea*, *T. sabrina*, *T. emilie* (sp. n.), *T. elioti*, and *T. riedeli*.)

"*Tanysiptera schlegeli* and *T. carolinæ*, Rosenb.," spp. nn., from Geelvink Bay. H. Schlegel, *N. T. D.* iv. pp. 12-14.

CAPITONIDÆ.

✓ MARSHALL, C. H. T., & G. F. L. A Monograph of the *Capitonidæ* or Scansorial Barbets. London: 1871. Parts vi.-ix. Roy. 8vo.

(This fine work is now completed. The species figured are:—Part vi. *Pogonorchynchus rolleti*, *P. diadematus*, *P. melanocephalus*, *Megaléma inornata* (*Zool. Rec.* vii. p. 43), *Gymnobucco bonapartii*, *Xantholéma malabarica*, *Barbatula bilineata*, *B. atrofava*, and *Capito versicolor*. Part vii. *Xantholéma rosca*, *Megaléma javensis*, *M. mystacophonus*, *M. humii* (*Zool. Rec.* vii. p. 43) and *M. franklini*, *Tetragonops rhamphastinus*, *Gymnobucco calvus*, and *Xylobucco scolopaceus*. Part viii. *Megaléma armillaris*, *M. chrysopsis*, *M. corvina*, *Pogonorchynchus vieilloti*, *P. leucomelas*, *Capito richardsoni*, *C. niger*, and *C. auratus*. Part ix. *Pogonorchynchus melanopterus*, *P. undatus*, *Barbatula leucoléma*, *B. pusilla*, *B. subsulphurea*, *B. chrysocoma*, *B. uropygialis*, *Capito*

glaucogularis, *C. quinticolor*, *Megalæma legrandieri*, *M. duvauceli*, and *M. cyanotis*.

Gymnobucco peli is *G. calvus* ♀: *Id. ut supra*, pt. vii. Distinct, and their heads figured: R. B. Sharpe, P. Z. S. 1871, p. 606.

Tricholæma hirsuta, young described. *Id. tom. cit.* p. 605.

Barbatula extoni, sp. n., from the Bechuana country in Southern Africa, allied to *B. chrysocoma*. E. L. Layard, Ibis, 1871, p. 226.

"*Bucco lathamii*," Gm., not at present correctly identified, and certainly not referable to *Calorhamphus hayi*. Ld. Walden, Ibis, 1871, p. 163.

BUCEROTIDÆ.

Berenicornis albocristatus,* difference in the bill of Fantee and Gaboon (typical) specimens described and figured*. R. B. Sharpe, P. Z. S. 1871, p. 604.

Buceros casuarinus, sp. n., from West Africa. G. R. Gray, Ann. N. H. (4) viii. pp. 437, 438, pl. xvii. (head).

Buceros subcylindricus (Zool. Rec. vii. p. 43), head figured. P. L. Sclater, P. Z. S. 1871, p. 490.

UPUPIDÆ.

Upupa epops, its fossil remains figured: A. Milne-Edwards, Ois. Foss. Fr. pl. 156, figs. 26, 27. Figured, and a review of the genus given: *U. decorata* (Zool. Rec. ii. p. 98) is *U. minor* ♀, Shaw. R. B. Sharpe & H. E. Dresser, B. Eur. pt. vii.

MUSOPHAGIDÆ.

Musophaga rossæ, its habitat. J. Gould, P. Z. S. 1871, p. 1; R. B. Sharpe, *tom. cit.* p. 134.

Corythaix albocristata. The red feathers lose their colour on being wetted. J. P. Verreaux, P. Z. S. 1871, pp. 40, 41.

Schizorhis concolor, its habits. H. Exton, Ibis, 1871, pp. 107-109.

CUCULIDÆ.

Cuculus canorus, detailed list of its eggs with reference to the assimilation-theory: E. Rey, J. f. O. 1871, pp. 225-228. Notes bearing on the same subject, and also on the adult ejecting the young of the nest-owners: — Dybowski *tom. cit.* pp. 393, 394. Its call musically expressed, J. Oppel, Zool. Gart. 1871, pp. 33-56. In Africa, J. H. Gurney, Ibis, 1871, p. 103.

Cuculus gularis, its specific characters. *Id. loc. cit.*

Cuculus tamsuicus and *C. michieanus* (Zool. Rec. vii. p. 43) are *C. poliocephalus*, Lath., and *C. micropterus*, Gould, respectively; and *C. monosyllabicus* (Zool. Rec. ii. p. 99) and *C. kelungensis* are *C. striatus*, Drap. R. Swinhoe, P. Z. S. 1871, pp. 395, 396.

Oxylophus glandarius figured. J. Gould, B. Gr. Br. pt. xx.

Phænicophaes curvirostris, its synonymy. Ld. Walden, Ibis, 1871, p. 162.

Centropus. Notes on the Papuan species. H. Schlegel, N. T. D. iv. pp. 10-12.

Coccyzus americanus in Wales. H. E. Dresser, P. Z. S. 1871, p. 299.

* I have since seen many specimens from Fantee, and find the character constant. The bird from this locality must be separated as *B. leucolophus*, sp. n.—R. B. S.

CAPRIMULGIDÆ.

Caprimulgus ruficollis figured. J. Gould, B. Gt. Br. pt. xix.

Caprimulgus uniwini, sp. n., from Murdan. A. O. Hume, Ibis, 1871, pp. 406, 407.

Caprimulgus enarratus, sp. n., from Madagascar. G. R. Gray, Ann. N. H. (4) viii. pp. 428, 429.

CYPSELIDÆ.

Cypselus pekinensis, sp. n., from North China, allied to *C. apus*: R. Swinhoe, P. Z. S. 1870, p. 435. Also from India: *Id. op. cit.* 1871, p. 345.

Cypselus gracilis, sp. n., Madagascar, allied to *C. parvus*, with which it has been confounded. R. B. Sharpe, *tom. cit.* 1871, p. 315.

Cypselus infumatus (Zool. Rec. vii. p. 44) figured. T. C. Jerdon, Ibis, 1871, pl. x.

Cypselus ignotus and *Collocalia incerta*, their fossil remains figured. A. Milne-Edwards, Ols. Foss. Fr. pl. 159, figs. 18, 19, pl. 177, figs. 1-13.

TROCHILIDÆ.

ORTON, J. On the Condors and Humming-birds of the Equatorial Andes. Ann. N. H. (4) viii. pp. 185-192.

Good (original notes on the habits and distribution of some of the *Trochilidæ*.)

Helianthea osculans, *Heliangelus squamigularis*, *Helio-master albicrissa*, *Lesbia chlorura*, *Eriocnemis russata*, and *Polytmus leucorrhous*, spp. nn. The first from Peru, allied to *H. violifera*, the second from Columbia, allied to *H. clarissæ* and *Heliotrypha parzudakii*, the third from Ecuador, allied to *Helio-master longirostris*, the fourth supposed to be from Peru, and allied to *L. gouldi*, the fifth from Ecuador, allied to *E. aureliæ*; and the sixth, from the Amazons, has been before named (P. Z. S. 1867, pp. 584, 752). J. Gould, P. Z. S. 1871, pp. 503-505.

Spathura [potius *Steganura*] *solstitialis*, sp. n., from Ecuador. *Id.* Ann. N. H. (4) viii. pp. 61, 62.

Eupherusa poliocerca and *Cyanomyia viridifrons*, spp. nn., from Mexico: the first allied to *E. egregia*. D. G. Elliot, *tom. cit.* pp. 266, 267.

Heliotrypha barrali, *Thalurania lerehi*, *Hylocharis magica*, and *Doryfera euphrosynæ*, spp. nn., from Columbia, New Granada, Lower California, and Ecuador respectively. E. Mulsant & J. Verreaux, Ann. Soc. L. Lyon, xviii. pp. 106, 108, 110, and 319.

Eugenes spectabilis (Zool. Rec. iv. p. 91) distinct from *E. fulgens*. G. N. Lawrence, Ann. Lyc. N. Y. x. p. 140.

Eustephanus stokesi is *E. fernandensis* ♀. P. L. Sclater, Ibis, 1871, p. 180.

PASSERES.

PITTIDÆ.

Melampitta, subgen. nov., differs from *Pitta* in the shape of its wings and the velvety plumes of the face. The type is

M. lugubris, sp. n., from New Guinea. H. Schlegel, N. T. D. iv. p. 47.

Pitta novæ-guinææ. Its variations in the different Papuan Islands. *Id. tom. cit.* p. 16.

Pitta rosenbergi, sp. n., from the Bay of Geelvink, allied to *P. novæ-guinææ*, but having a longer tarsus and many differences of coloration. *Id. tom. cit.* pp. 16, 17.

Pitta (Phœnicocichla) arquata, sp. n., from Borneo. J. Gould, *Ann. N. H.* (4) vii. p. 340.

Pitta bengalensis and *P. oreas* (Zool. Rec. i. p. 74) figured. *Id. B. As. pt. xxiii.*

Pitta bertæ (Zool. Rec. v. p. 76) distinct from *P. cyanoptera*. T. Salvadori, *Ibis*, 1871, p. 248.

MENURIDÆ.

Orthonyx spinicauda in New Guinea. H. Schlegel, *N. T. D.* iv. p. 47.

DENDROCOLAPTIDÆ.

"*Anabates turdinus*, Natt.," "*Philydor striaticollis*, Lafr.," and *Dendrocaptus chuncotambo*, Tsch., are respectively *A. ochrolæmus*, Tsch., *A. montanus*, Tsch., and *Dendronis ocellata* (Spix). P. L. Sclater, *P. Z. S.* 1871, p. 86.

Upucerthia dumetoria in Buenos Ayres. W. H. Hudson, *tom. cit.* p. 259.

Oxyurus masafueræ (Zool. Rec. iii. p. 87) figured. P. L. Sclater, *Ibis*, 1871, p. 180.

MELIPHAGIDÆ.

Myzomela rosenbergi, sp. n., from the northern peninsula of New Guinea, allied to *M. chermesina*, Gray, but having a black head and nape and reddish under surface. H. Schlegel, *N. T. D.* iv. pp. 38, 39.

Euthyrhynchus, subgen. nov., established for *E. griseigula*, *E. flavigula*, *E. fulvigula*, spp. nn., from New Guinea. *Id. tom. cit.* pp. 39, 40.

Chæloptila, gen. nov., the type being *Entomyza angustipluma*, Cassin, of the Sandwich Islands. P. L. Sclater, *Ibis*, 1871, p. 358.

Phyllornis cochinchinensis and its allies, notes on. Ld. Walden, *tom. cit.* p. 168.

Phyllornis chlorocephalus, sp. n., from Burma, allied to *P. icterocephalus*, but having a longer bill, a green crown, and wanting the golden nape. *Id. Ann. N. H.* (4) vii. p. 241.

Zosterops simplex [Swinh. 1862, *nec.* Hartl. 1868, *cf.* Zool. Rec. v. p. 79] and *Z. erythropleura* figured. J. Gould, *B. As. pt. xxiii.*

NECTARINIIDÆ.

Promerops gurneyi, sp. n., from Natal, like *P. capensis*, but with a rufous head and breast. J. Verreaux, *P. Z. S.* 1871, p. 135, pl. viii.

Nectarinia duyvenbodii, sp. n., from Sanghir. H. Schlegel, *N. T. D.* iv. p. 14.

Æthopyga lodoisia (Zool. Rec. ii. p. 104) distinct from *Æ. flavostriata* (*loc. cit.*). T. Salvadori, *Ibis*, 1871, p. 248.

Æthopyga siparaja, Raffl., and its allies, notes on. Ld. Walden, *tom. cit.* p. 166.

COTINGIDÆ.

Heteropelma igniceps, sp. n., from Oyapok in Cayenne, like *H. flavicapillus*, but with a broader bill, fiery head, and yellow belly. P. L. Sclater, *P. Z. S.* 1871, p. 750.

TIMALIIDÆ.

Mystacornis (Zool. Rec. vii. p. 52) belongs to this family, and not to *Sylviidae*. R. B. Sharpe, P. Z. S. 1871, pp. 314, 315.

Alethe castanonota, sp. n., from Fantee. *Id.* Cat. Afr. B. p. 20.

Cholornis, gen. nov., of which the type is

C. paradoxa, sp. n., from Chinese Thibet. J. Verreaux, N. Arch. Mus. vi. Bull. p. 35, vii. pp. 34, 35.

Paradoxornis guttaticollis, sp. n., from Szechuen and Moupin. *Id.* tom. cit. p. 14.

Alcippe pycilotis, sp. n., from Moupin. *Id.* op. cit. vi. p. 35, vii. pp. 37, 38.

Alcippe cinerea, sp. n., from Szechuen and Moupin. A. David, tom. cit. p. 14.

Turdinus striatus, sp. n., from the Khassia Hills, like the Malaccan *T. macrodactylus*, but smaller and with a striated throat. Ld. Walden, Ann. N. H. (4) vii. p. 241.

Pellornium subochraceum, sp. n., from Tenasserim, like *P. ruficeps*, but smaller, with a narrower bill and shorter tarsus. R. Swinhoe, tom. cit. p. 257.

Pellornium mandelli, sp. n., from Sikkim. W. T. Blanford, P. As. Soc. Beng. 1871, p. 216.

Pterorhinus davidi (Zool. Rec. v. p. 81) figured. J. Gould, B. As. pt. xxiii.

Pterorhinus maximus and *P. lanceolatus*, spp. nn., from Chinese Thibet. J. Verreaux, N. Arch. Mus. vi. Bull. p. 36, vii. pp. 40, 41. The former figured as *Ianthocincla maxima*, tom. cit. pl. 3, fig. 1, and described, vii. pp. 38, 39.

Ianthocincla lunulata, sp. n., from Chinese Thibet. *Id.* op. cit. vi. Bull. p. 36, pl. 3, fig. 2.

Trochalopteryx formosum, *T. ellioti*, and *T. blythi*, spp. nn., the first from Szechuen, the two last from the same and also Moupin. *Id.* op. cit. v. p. 35, vi. pp. 36, 37, vii. pp. 43-46.

Trochalopteryx simile, sp. n., North-western India, allied to *T. variegatum*, but with pure grey primaries and rectrices. A. O. Hume, Ibis, 1871, p. 408.

HIRUNDINIDÆ.

Hirundo rupestris, its fossil remains figured. A. Milne-Edwards, Ois. Foss. Fr. pl. 156, figs. 24, 25.

Hirundo leucorrhoa, its habits. W. H. Hudson, P. Z. S. 1871, pp. 327, 328.

Cecropis arctivittata, sp. n., from Northern China, of the *C. daurica* group. R. Swinhoe, tom. cit. p. 346.

ORIOLIDÆ.

Psaropholus trauilli and *P. ardens* figured. J. Gould, B. As. pt. xxiii.

Oriolus galbula, its nidification. A. Müller, Zool. Gart. 1871, pp. 275-279.

TYRANNIDÆ.

Myiozetetes grandis, sp. n., from Peru, larger than any other of the genus, and of a deeper yellow beneath. G. N. Lawrence, P. Ac. Philad. 1871, p. 234.

Myiozetetes and *Conopias*, remarks on, with a synoptical table of the species. P. L. Sclater, P. Z. S. 1871, pp. 751-756.

Ochthoeca murina, sp. n., from Oyapok. A synopsis of the species of the genus is added. *Id. tom. cit.* pp. 749, 750.

Euscarthmus fulviceps, sp. n., from Lima. Details of its structure figured. *Id. tom. cit.* p. 497.

Myiarchus cooperi, Baird, is *Tyrannula mexicana*, Kaup (P. Z. S. 1851, p. 51), and *Blacicus tristis* (Gosse) is *Tyrannula barbirostris*, Sw. (Phil. Mag. 1827, p. 367). *Id. tom. cit.* pp. 84, 85.

Anæretes fernandezianus (Philippi) figured. *Id. Ibis*, 1871, p. 179, pl. vii. fig. 1.

Myiarchus yucatanensis, sp. n., from Yucatan. G. N. Lawrence, P. Ac. Philad. 1871, p. 235.

Empidonax atirostris, sp. n., from Venezuela?, allied to *E. trailli*. *Id. tom. cit.* p. 234.

Serpophaga grisea, sp. n., from Costa Rica, allied to *S. cinerea*. *Id. Ann. Lyc. N. Y. x.* pp. 139, 140.

DICRURIDÆ.

Dicrurus cathæcus, sp. n., from China. R. Swinhoe, P. Z. S. 1871, p. 377.

LANIIDÆ.

Lanius auriculatus, *L. collurio*, *L. nubicus*, *L. excubitor*, *L. algeriensis*, and *L. meridionalis* figured. R. B. Sharpe & H. E. Dresser, B. Eur. pts. i.-iv., ix.

Lanius minor. Notes on its breeding. J. Hocker, J. f. O. 1871, p. 464.

Lanius miocænus, its fossil remains figured. A. Milne-Edwards, Ois. Foss. Fr. pl. 159, figs. 1-3.

Lanius incertus, sp. n., from Amoy, belonging to the *L. cristatus* group. R. Swinhoe, P. Z. S. 1871, pp. 376, 377.

Lanius phœnicurus, Pall., is probably *L. cristatus*, L., *vest. nupt.* *Id. Walden, Ibis*, 1871, p. 173.

Tephrodornis. Remarks on the Indo-Malayan species of the genus. *Id. loc. cit.*

Dryoscopus guttatus (Zool. Rec. ii. p. 108) is *D. major*, Hartl. (Orn. Westafr. p. 111). R. B. Sharpe, Cat. Afr. B. p. 47.

CAMPEPHAGIDÆ.

Colluricincla concinna, sp. n., from Nelson, New Zealand. F. W. Hutton, Cat. B. N. Zeal. p. 15. [Is *Graucalus melanops*, *Id. Ibis*, 1872, p. 201.]

Campephaga strenua, *C. albilora*, and *C. leucoptera*, spp. nn., from New Guinea, Jobie, and Soek [the last-named being a *Lalage*]. H. Schlegel, N. T. D. iv. pp. 44-46.

Oriolia bernieri is *Artamia leucocephala*, and *A. rufa* is a *Vanga*. R. B. Sharpe, P. Z. S. 1871, pp. 318, 319.

"*Pachycephala schlegeli*, Rosenb.," sp. n., from the interior of New Guinea, remarkable for its small size, large pectoral band, black wings, and orange belly. H. Schlegel, N. T. D. iv. pp. 43, 44.

Reotes nigrescens, sp. n., from the northern peninsula of New Guinea. *Id. tom. cit.* p. 46.

MUSCICAPIDÆ.

Siphia hodgsoni, sp. n., from Moupin. J. Verreaux, N. Arch. Mus. vi. Bull. p. 34.

Butalis grisola in India. A. O. Hume, Ibis, 1871, p. 26.

Butalis epulata, juv., described. R. B. Sharpe, Ann. N. H. (4) viii. p. 234.

Muscicapa [P] *muelleriana* and *Myiagra glauca*, spp. nn., from New Guinea. H. Schlegel, N. T. D. iv. pp. 40, 41.

Rhipidura fumosa and *R. brachyrhyncha*, spp. nn., from the island of Jobie and the northern peninsula of New Guinea. *Id. tom. cit.* p. 42.

Machirhynchus nigripictus, sp. n., from the northern peninsula of New Guinea, distinguished by its black breast and yellow throat. *Id. tom. cit.* p. 43.

"*Monarcha brehmi*, Rosenb.," sp. n., from Geelvink Bay, unlike any other known species. *Id. tom. cit.* pp. 14, 15.

Monarches dimidiatus, sp. n., from Rarotonga. G. Hartlaub & O. Finsch, P. Z. S. 1871, p. 28.

Stenostira plumbea is a *Parisoma*. R. B. Sharpe, Cat. Afr. B. p. 41.

Parisoma layardi, Hartl. (Ibis, 1862, p. 147), is *P. subcæruleum* (Gm.), ♀. *Id. tom. cit.* p. 41.

MNIOTILTIDÆ.

Parula insularis, sp. n., from the Tres Marias and Socorro Islands, off the west coast of Mexico. G. N. Lawrence "Ann. Lyc. N. York, x. p. 4," P. Bost. Soc. 7 June, 1871.

CINCLIDÆ.

Cinclus melanogaster figured. J. Gould, B. Gr. Br. pt. xix.

TURDIDÆ.

Turdus musicus, *T. viscivorus* (from which *T. hodgsoni* is not distinct), and *T. pilaris* figured. R. B. Sharpe & H. E. Dresser, B. Eur. pts. v., vi., viii.

Turdus atrigularis figured. J. Gould, B. Gr. Br. pt. xix.

"*Turdus mystacinus*, Severzow," sp. n., from Turkestan, closely allied to *T. atrigularis*, if, indeed, separable. C. Dode, P. Z. S. 1871, p. 481.

Turdus fuscatus, its egg. H. E. Dresser, *tom. cit.* p. 104.

Turdus pallens, Pall., its synonymy. Ld. Walden, Ibis, 1871, p. 168.

Turdus pelios and *T. olivaceus* (head only) figured: T. von Heuglin, Orn. N.-O. Afr. tab. xiv. Notes on the latter and *T. olivaceus*: *Id. J. f. O.* 1871, pp. 206-208. *T. pelios*, Bp., is really from Central Asia; the African species so called must bear the name *T. icterorhynchus*, P. Württ. J. Cabanis, *op. cit.* 1870, p. 424.

Turdus strepitans, A. Smith (Ill. Zool. S. Afr. pl. 37, 1849), is *T. litsitsirupa*, ejusd. (Rep. Exp. C. Afr. p. 45, 1836), and *Merula obscura*, A. Smith (1849), and *T. cabanisi*, Bp. (1850), are *T. olivaceus*, L. R. B. Sharpe, Cat. Afr. B. pp. 20, 21.

Turdus crossleyi, sp. n., from Cameroons, allied to *T. gurneyi* (Zool. Rec. i. p. 79), but has black cheeks, lores, and chin, and an orange collar. *Id. P. Z. S.* 1871, pp. 607, 608, pl. xlviii.

Turdus fulviventris, Sclater (P. Z. S. 1857, p. 273), is *Merula euryzona*, Dubus, Esq. Orn. tab. 34 (1850). P. L. Sclater & O. Salvin, Ibis, 1871, p. 320.

Turdus auritus and *Merula gouldi*, spp. nn., from Moupin. J. Verreaux, N. Arch. Mus. vi. Bull. p. 34, vii. pp. 32, 33.

Turdus merula, its song expressed musically. J. Oppel, Zool. Gart. 1871, pp. 33-56.

"*Harporhynchus graysoni*, Baird, Ann. Lyc. N. York, x. p. 1," sp. n., from Socorro Island, west coast of Mexico. G. N. Lawrence, P. Bost. Soc. 7 June 1871.

Minus nigriloris, sp. n., from Mexico, allied to *M. thenca* and *M. longicaudatus*. Id. Ann. Lyc. N. Y. x. pp. 137, 138.

Minus melanotis and its allies. C. J. Sundevall, P. Z. S. 1871, pp. 126, 127.

Cinclosoma artemisiæ, sp. n., allied to *C. ocellatum*, Vig., but differing in many particulars. A. David, Ann. N. H. (4) vii. p. 256.

Spizixus cinereicapillus, sp. n., from Formosa, like *S. semitorques*, but grey on the head instead of black. R. Swinhoe, P. Z. S. 1871, p. 370.

Hypsipetes yumanensis, sp. n., from Ponsee in Yunan. J. Anderson, *tom. cit.* p. 213.

Crateropus [?] *gutturialis*, sp. n., from Huilla, very unlike any other of the genus. J. V. Barboza du Bocage, Jorn. Sc. Lisb. iii. p. 339.

Pericrocotus flammeus from Java probably distinct from the Ceylonese type. Id. Walden, Ibis, 1871, p. 174.

Criniger gularis (Horsf.) (*nec* Swains.) and *C. phaeocephalus*, Hartl., figured. Id. *tom. cit.* p. 169, pl. vi.

Criniger finschi, sp. n., from Borneo, allied to *C. carlottæ* [Zool. Rec. iv. p. 101]. T. Salvadori, Atti Acc. Tor. vi. p. 128.

Criniger verreauxi is the name proposed for *C. gularis*, Swains. (*nec* Horsf.), *C. tephrogenys*, Finsch (*nec* Jard.). R. B. Sharpe, Cat. Afr. B. p. 21.

Geocichla tricolor, sp. n., from Hill Tipperah. A. O. Hume, Ibis, 1871, p. 412.

Irena puella and its allies, further remarks on (*cf.* Zool. Rec. vii. p. 51). Id. Walden, *tom. cit.* pp. 170-173.

Cossypha sharpii, sp. n., from Madagascar: G. R. Gray, Ann. N. H. (4) viii. p. 429. Probably *C. imerina*, Hartl. R. B. Sharpe, P. Z. S. 1871, pp. 316, 317.

Copsychus, on the species of. Id. Walden, Ibis, 1871, p. 174.

Petrocossyphus cyanus figured, and the changes of plumage in the ♀ recorded. R. B. Sharpe & H. E. Dresser, B. Eur. pt. viii.

Pycnonotus gabonensis, sp. n., from Gaboon, like *P. barbatus* (with which *P. inornatus*, Fraser, is identified), but darker, and with a yellowish vent. Both figured, as is also *P. tricolor*, and a list of the African species given. R. B. Sharpe, P. Z. S. 1871, pp. 131, 132, pl. vii.

SYLVIIDÆ.

Callene zonura, sp. n., from Eastern Thibet: J. Verreaux, N. Arch. Mus. v. Bull. p. 35. Is *Hodgsonius phaniceuroides*: R. Swinhoe, P. Z. S. 1871, p. 359.

Motacilla leucorrhœa, Gm., is *Saxicola ænanthe* (L.). R. B. Sharpe, Cat. Afr. B. p. 26.

Saxicola kingi, sp. n., from Jodhpoor: *S. ænanthe* of Indian ornithologists is *S. saltator*. A. O. Hume, Ibis, 1871, pp. 29, 30.

- Savicola hendersoni*, sp. n., from Yarkand. *Id. tom. cit.* p. 408.
- Pratincola rubicola* (as well as *P. indica*) and *P. rubetra* in India. *Id. tom. cit.* pp. 27, 28.
- Ruticilla aurea*, its egg. H. E. Dresser, P. Z. S. 1871, p. 104.
- Lusciola caerulecula* and its different forms in Westphalia. H. Landois, Zool. Gart. 1871, pp. 353-355.
- Lusciola akahige*, in India. A. O. Hume, Ibis, 1871, p. 31.
- Accentor multistriatus*, sp. n., from Western Szechuen, allied to *A. strophilatus*, but having no rufous above, and the pectoral band narrower. A. David, Ann. N. H. (4) vii. p. 256.
- Accentor montanellus*, *A. rubidus*, *A. erythropygius* (Zool. Rec. vii. p. 52), figured. J. Gould, B. As. pt. xxiii.
- Calamoherpe palustris*, its nest. H. Schröder, Zool. Gart. 1871, p. 127.
- Calamoherpe brevipennis*, from the Cape-Verd Islands (cf. N. T. D. iii. p. 368), now first described. H. Dohrn, J. f. O. 1871, pp. 4, 5.
- Calamoherpe concinens*, from Pekin, R. Swinhoe. P. Z. S. 1870, p. 432.—*C. subflavescens* (Zool. Rec. vii. p. 52) is *Acrocephalus fasciolatus*, Gray (P. Z. S. 1860, p. 349). *Id. op. cit.* 1871, p. 352.
- Herbivox*, gen. nov., includes *Salicaria cantans*, *Arundinax canturiens* and *A. minuta*. *Id. tom. cit.* p. 353.
- Arundinax davidiana*, sp. n., from Chinese Thibet. J. Verreaux, N. Arch. Mus. vi. Bull. p. 37, vii. pp. 46, 47.
- Arundinax flemingi*, sp. n., from Tientsin. R. Swinhoe, P. Z. S. 1870, p. 440. Referred to
- Herbivocula*, subgen. nov. *Id. op. cit.* 1871, p. 354.
- Calamodyta aquatica* figured. J. Gould, B. Gr. Br. pt. xix.
- Locustella tacsanowskia*, sp. n., from Transbaikal, allied to *L. ochotensis*, but smaller, unspotted beneath, and the tail untipped. R. Swinhoe, P. Z. S. 1871, p. 355.
- Locustella ochotensis* is *L. certhiola* juv. J. Cabanis, J. f. O. 1871, p. 156.
- Sylvia fluviatilis*, its habits. C. Arlt, *tom. cit.* pp. 27-34.
- Iduna salicaria* in India. A. O. Hume, Ibis, 1871, p. 33.
- Sylvia obscura*, A. Smith, is *Hypolais salicaria*. R. B. Sharpe, Cat. Afr. B. p. 33.
- Sylvia rueppelli*, juv., described. E. Rey, J. f. O. 1871, p. 462.
- Sylvia orphea*, *S. cinerea*, and *S. delicatula* in India. A. O. Hume, Ibis, 1871, p. 32.
- Aedon familiaris* in India. *Id. tom. cit.* p. 30.
- Mystacornis crossleyi* (Zool. Rec. vii. p. 52) belongs to *Timaliidae*. R. B. Sharpe, P. Z. S. 1871, p. 314.
- Culicipeta tephrocephalus*, sp. n., from Burma, allied to *C. burkii*, but with a grey head and nape. J. Anderson, *tom. cit.* p. 213.
- Suya superciliaris*, sp. n., from Yunan. *Id. loc. cit.*
- Dumeticola major*, sp. n., from Cashmir, like *D. hodgsoni*, but larger. W. E. Brooks, P. As. Soc. Beng. 1871, p. 210.
- Suya albosuperciliaris*, sp. n., from Yarkand. A. O. Hume, Ibis, 1871, p. 409.
- Drymæca*, sp. A second species occurs in Egypt. G. E. Shelley, *tom. cit.* p. 134. [Is *D. gracilis*, var. *Id.* B. Egypt, p. 98.]

Drymæca pectoralis and *D. pallida*, A. Smith, and *D. ortleppi* (Zool. Rec. vi. p. 84) referred to *D. flavicans* (Vieill.), and *D. substriata*, A. Smith, to *D. maculosa* (Bodd.) (*capensis*, auctt.). R. B. Sharpe, Cat. Afr. B. p. 30.

Bradypterus platyurus, Sw., and *B. sylvaticus*, Victorin (the first after examination of the type), referred to *Sylvia brachyptera*, Vieill. [cf. Ibis, 1869, p. 366]. *Id. tom. cit.* p. 33.

Prinia. The second Ceylonese species (Zool. Rec. vii. p. 53) is *P. socialis*, Sykes. Ld. Walden, P. Z. S. 1871, p. 258.

Cisticola ruficollis, sp. n., from Assam. *Id. Ann. N. H.* (4) vii. p. 242.

Cisticola melanocephala, sp. n., from Yunnan. J. Anderson, P. Z. S. 1871, p. 212.

Phyllopneuste macrorhyncha (Zool. Rec. vi. p. 84) is an *Acrocephalus*. A. O. Hume, Ibis, 1871, p. 31.

Sylvia sylvicola, variation in its song. T. R. A. Briggs, Rep. Plym. Inst. iv. pp. 152, 153.

Phyllopneuste brehmi, sp. n., from Portugal, allied to *P. rufa*. E. F. von Homeyer, Erinn. Vers. deutsch. Orn. 1870, p. 48.

Phyllopneuste major, sp. n., from Algeria. *P. brevirostris* and *P. rufa*, their differences. H. B. Tristram, Ann. N. H. (4) viii. pp. 28, 29.

Phyllopneuste eversmanni (Midd.) (*nec* Bp.) is *P. sylvicultrix*. *P. fuscata*, notes on. *Id. Ibis*, 1871, pp. 109, 110 (cf. *tom. cit.* p. 233). *P. eversmanni* (Midd.), *P. sylvicultrix*, and *P. flavescens* (Gray, P. Z. S. 1860, p. 349) are *P. borealis*, Blas.: R. Swinhoe, P. Z. S. 1871, pp. 356, 357. As also is *P. kennicotti* (Zool. Rec. v. p. 84): H. B. Tristram, Ibis, 1871, p. 231.

Phyllopneuste schwartzi is *P. viridanus* (Blyth, J. A. S. B. xii. p. 967): *Id. tom. cit.* p. 109. A good species: J. Cabanis, J. f. O. 1871, p. 150.

Phylloscopus pallidipes, sp. n., from Sikkim, small and with pale tarsi. W. T. Blanford, P. As. Soc. Beng. 1871, p. 215.

Phylloscopus tyleri and *Horites pallidus*, spp. nn., from Cashmir, the first allied to *P. viridanus*. W. E. Brooks, *tom. cit.* p. 210.

Abornis jerdoni, sp. n., from Eastern India. *Id. tom. cit.* p. 248.

Abornis acanthizoides, sp. n., from Chinese Thibet. J. Verreaux, N. Arch. Mus. Bull. vi. p. 37, vii. p. 47.

Reguloides superciliosus, its egg. H. E. Dresser, P. Z. S. 1871, p. 103.

Reguloides occipitalis is *Phyllopneuste coronata*, T. & S. H. B. Tristram, Ibis, 1871, p. 233.

MOTACILLIDÆ.

Motacilla cashmiriensis, sp. n., from Cashmir, allied to *M. luzoniensis*. W. E. Brooks, P. As. Soc. Beng. 1871, p. 210.

Motacilla baicalensis, sp. n., from Lake Baikal, resembling *M. alba* and *M. dukhunensis*. Also from the same district a var. *temporalis*. R. Swinhoe, P. Z. S. 1871, p. 363.

Motacilla citreola, its egg. H. E. Dresser, *tom. cit.* p. 104.

Motacilla humata and *M. major*, their fossil remains figured. A. Milne-Edwards, Ois. Foss. Fr. pl. 158, figs. 1-11, pl. 159, figs. 10, 11, 13, 14.

Budytes viridis is *B. cinereocapillus* or *B. melanocephalus*, juv. Notes on *Budytes citreolus* added. A. O. Hume, Ibis, 1871, p. 34.

Anthus pratensis, *A. spinoletta* and *Agrodroma campestris* in India. *Id. tom. cit.* pp. 35, 36.

Pipastes agilis is *P. arboreus*. *Id. loc. cit.*

Anthus cervinus and *A. rosaceus*, notes on. *Id. loc. cit.*

Anthus japonicus is distinct from the western *A. cervinus*, Pall. (*A. rufigularis*, Brehm.). H. B. Tristram, *tom. cit.* p. 234.

Anthus leucophrys, *A. cinnamomeus*, *A. sordidus* and *A. gouldi* [*cf. Zool. Rec.* vi. p. 85] identified with *Alauda erythronotus*, Steph. R. B. Sharpe, *Cat. Afr. B.* p. 72. All identical with *Alauda pyrrhonota*, Vieill., the oldest specific name. E. L. Layard, *Ibis*, 1871, p. 228.

TROGLODYTIDÆ.

"*Troglodytes insularis*, Baird, *Ann. Lyc. N. York*, x. p. 3," sp. n., from Socorro Island, coast of Mexico. G. N. Lawrence, *P. Bost. Soc.* 7 June, 1871.

Catherpes sumichrasti, sp. n., from Vera Cruz. *Id. P. Ac. Philad.* 1871, p. 233.

Pnoepyga troglodytoides, sp. n., from Moupin. J. Verreaux, *N. Arch. Mus.* vi. Bull. p. 34, vii. p. 30.

CERTHIIDÆ.

Tichodroma muraria figured. R. B. Sharpe & H. E. Dresser, *B. Eur.* pt. viii.

Certhia hodgsoni is a new species from Cashmir, closely allied to *C. familiaris*. W. E. Brooks, *P. As. Soc. Beng.* 1871, p. 209.

CÆREBIDÆ.

FINSCH, O. *Monographie der Gattung Certhiola*. *Verh. z.-b. Wien*, xxi. pp. 738-790, Taf. iv.

This monograph recognizes only 10 species in place of 20 (*cf. Zool. Rec.* vii. p. 54).

SITTIDÆ.

Sitta amurensis, sp. n., from China and the Amoor, allied to *S. cæsia*. R. Swinhoe, *P. Z. S.* 1871, p. 350.

Sitta sinensis, sp. n., from Moupin. J. Verreaux, *N. Arch. Mus.* vi. Bull. p. 34, vii. pp. 28, 29.

Sitta cashmirensis, sp. n., from Cashmir, allied to *S. cæsia* and *S. himalayana*. W. E. Brooks, *P. As. Soc. Beng.* 1871, p. 209.

Sitta krueperi, the young described. E. Rey, *J. f. O.* 1871, pp. 459, 460.

Sitta [potiùs *Sittella*] *papuensis*, sp. n., from the northern peninsula of New Guinea. H. Schlegel, *N. T. D.* pp. 47, 48.

PARIDÆ.

(*Parus britannicus*) sp. n., from the British Isles, hitherto confounded with *P. ater*, L., but having an olive-coloured instead of a blue back. R. B. Sharpe & H. E. Dresser, *Ann. N. H.* (4) viii. p. 437.

Parus oblectus, sp. n., from Lake Baikal, related to *P. cinctus* as *P. borealis* is to *P. palustris*: J. Cabanis, *J. f. O.* 1871, p. 237 (1 May). Is *P. griseus*: R. B. Sharpe & H. E. Dresser, *B. Eur.* pt. vi. (August).

Lophophanes cristatus, *Parus major*, *P. palustris*, *P. cinctus*, *P. cæruleus*, and *P. teneriffæ* are figured. *Id. op. cit.* pts. i., ii., v., vi., viii.

Pœcile baicalensis, sp. n., from Trans-Baikal. R. Swinhoe, *Ann. N. H.* (4) vii. p. 257.

Parus cyanus, its habits. T. Lorenz, J. f. O. 1871, pp. 124-130. [Translated, Sharpe & Dresser, B. Eur. pt. x.]

Parus ledoucii figured. J. H. Gurney, Jun., Ibis, 1871, p. 86, pl. iii.

"*Parus ouratensis*, David," and "*Mecistura ouratensis*, David," spp. nn., from North China. The first is *P. cinctus*. R. Swinhoe, P. Z. S. 1870, p. 430.

Acredula irbii, sp. n., from Spain. R. B. Sharpe & H. E. Dresser, P. Z. S. 1871, pp. 312, 313.

Mecistura vinacea and *M. fuliginosa*, spp. nn., from Chinese Thibet. J. Verreaux, N. Arch. Mus. vi. Bull. p. 39, vii. pp. 56-58.

Staphida, subgen. nov., allied to *Ixulus*, established for

Siva torqueola (Zool. Rec. vii. p. 54) and *I. castaneiceps*, Moore: R. Swinhoe, P. Z. S. 1871, pp. 373, 374. The first figured and also *Parus venustus* (Zool. Rec. loc. cit.). J. Gould, B. As. pt. xxiii.

Siva cinereiceps, *S. ruficapilla* and *S. striaticollis*, spp. nn., from Chinese Thibet. J. Verreaux, N. Arch. Mus. vi. Bull. pp. 37, 38, vii. pp. 48-50.

Minla jerdoni, sp. n., from Chinese Thibet. *Id. op. cit.* vi. p. 38, vii. pp. 52, 53.

Proparus swinhoii, sp. n., from Chinese Thibet. *Id. op. cit.* vi. p. 38, vii. pp. 51, 52.

Yuhina diademata, sp. n., from Moupin and Szechuen. *Id. op. cit.* v. p. 35, vii. pp. 53, 54.

Allotrius xanthochlorus, var. *pallidus*, from Szechuen. A. David, *op. cit.* vii. p. 14. Is *A. sophiae*, sp. n.: J. Verreaux, *tom. cit.* p. 64.

Xerophila pectoralis, sp. n., from South Australia. J. Gould, Ann. N. H. (4) viii. p. 172.

TANAGRIDÆ.

Saltator flavidicollis probably *Saltator olivaceus* ♀ vel juv. P. L. Sclater & O. Salvin, Ibis, 1871, p. 327.

Buarremon sordidus, sp. n., from Bogota, related to *B. leucopterus* and *B. pallidinuchus*. G. N. Lawrence, Ann. Lyc. N. Y. x. pp. 138, 139.

PLOCEIDÆ.

Ploceus megarhynchus (Zool. Rec. vi. p. 87), further notes on. A. O. Hume, Ibis, 1871, p. 36.

Hyphantornis mariguensis and *H. velatus*, notes on. J. H. Gurney, Ibis, 1871, p. 254, 255.

Hyphantornis intermedia, *H. tænioptera*, *H. vitellina*, *H. galbula*, and *H. guerini*, heads figured. T. von Heuglin, Orn. N.-O. Afr. tab. xviii.

Nigrita arnaudi figured. *Id. op. cit.* tab. xx.

Nigrita. Synopsis of the seven species. R. B. Sharpe, P. Z. S. 1871, p. 613.

Hypochoera nigerrima, sp. n., from Angola. *Id. tom. cit.* p. 131.

Urobrachya bocagii, sp. n., from Angola, like *U. axillaris*, Smith, but stouter and with an orange shoulder-patch. *Id. Cat. Afr. B.* p. 63.

Estrellda carmelita [Zool. Rec. v. p. 90] is *Vidua principalis*, juv. *Id. loc. cit.*

Estrellda cyanogastra (Daud.), generally confounded with *E. phanictis* (Sw.), is distinct, having no red ear. *Id. tom. cit.* p. 65.

FRINGILLIDÆ.

RUSS, K. Zur Charakteristik einiger fremdländischen Finken. J. f. O. 1871, pp. 14-20.

Notes on various exotic species in confinement.

SCLATER, P. L. A revision of the Fringilline genus *Spermophila*. Ibis, 1871, pp. 1-23, pls. i. & ii.

A monograph in the author's usual excellent style. He first gives a synonymic and diagnostic list of the 24 species known to him, dividing them into two groups (*pyrrhomelane* and *leucomelane*), the characters of which are further indicated by a key, and then follow remarks on other described species of the genus not known to the author, the whole being concluded by a notice of the geographical distribution of these birds throughout the four Neotropical Subregions which they inhabit. A very considerable number of nominal species are herein destroyed. It is only necessary now to mention that *S. atriceps* (Zool. Rec. iv. p. 107) is united with *S. torqueola*, *S. hicksi*, *S. fortipes*, and *S. collaris* (Zool. Rec. ii. pp. 118, 119) with *S. aurita*, and that *S. badiiventris* (loc. cit.) is *S. corvina*. As this result is obtained after examination of the types, the determinations can scarcely be erroneous. The species figured are *S. nigrorufa*, ♂ & ♀, *S. pileata*, *S. aurita*, and *S. ocellata*.

Dolospingus, gen. nov., allied to *Spermophila*, the type being

D. nuchalis, sp. n., from the Oronoco. D. G. Elliot, tom. cit. pp. 402-403, pl. xi.

Fringilla montifringilla figured. R. B. Sharpe & H. E. Dresser, B. Eur. pt. vii.

"*Passer ouratensis*, David," sp. n., from North China. R. Swinhoe, P. Z. S. 1870, p. 430.

Passer ammodendri, sp. n., from Turkestan. C. Dode, op. cit. 1871, p. 481.

Montifringilla ruficollis, sp. n., from Sikkim. W. T. Blanford, P. As. Soc. Beng. 1871, p. 227.

Spermospiza hematina not distinct from *S. guttata*. R. B. Sharpe, Ann. N. H. (4) viii. pp. 237, 238.

Poliospiza striaticeps, Hartl., identified with *Linaria gularis*, A. Smith, 1836. Id. Cat. Afr. B. p. 68.

Poliospiza crococygia, sp. n., from Damara Land, like *P. xanthopygia*, but larger: Id. Ibis, 1871, p. 101. Referred to *Crithagra*: Id. Ann. N. H. (4) viii. p. 235.

Crithagra leucoptera, sp. n., from South Africa. C. *albogularis*, its synonymy. Id. loc. cit.

Xanthodira dentata and *X. pyrgita* (head only) figured. M. T. von Heuglin Orn. N.-O. Afr. tab. xxi. a.

Ligurinus chloroticus in Spain. H. Saunders, Ibis, 1871, p. 219.

Chloroptila, gen. nov., proposed for

Fringilla citrinella, which is but rare in Italy. T. Salvadori, Atti Acc. Tor. vii. p. 260.

Serinus pusillus. Notes on its plumage by M. A. H. Bétant. E. Balamus, J. f. O. 1871, pp. 229, 230.

Propasser saturatus, sp. n., from Sikkim. W. T. Blanford, P. As. Soc. Beng. 1871, p. 216.

Procarduelis rubescens, sp. n., from Sikkim, allied to *P. nipalensis*. Id. P. Z. S. 1871, pp. 691-695, pl. lxxiv.

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- Leucosticte griseinucha*, its egg. A. Newton, *tom. cit.* p. 56.
- Pyrrhula*. Synopsis of the 9 known species: H. B. Tristram, *Ibis*, 1871, p. 232. Further notes on the genus: J. Cabanis, *J. f. O.* 1871, pp. 316-319.
- Pyrrhula incarnata*, sp. n., from Turkestan. C. Dode, *P. Z. S.* 1871, p. 480 [= *Erythrospiza githaginea*, R. B. S.].
- Carpodacus erythrinus*, figured. J. Gould, *B. Gr. Br. pt. xix.*; R. B. Sharpe & H. E. Dresser, *B. Eur. pt. vi.*
- Fringilla incerta*, Risso, notes on. *Id. loc. cit.*
- Carpodacus mongolicus*, sp. n., from North China. R. Swinhoe, *P. Z. S.* 1870, p. 447.
- Carpodacus edwardsi*, *C. trifasciatus* and *C. vinaceus*, spp. nn., from Moupin and Szechuen. J. Verreaux, *N. Arch. Mus. vi. Bull. p. 39, vii. pp. 58-62.*
- Carpodacus verreauxi*, sp. n., from Chinese Thibet. A. David, *tom. cit.* p. 62.
- Pyrgilauda*, gen. nov., of which the type is
- P. davidiana*, sp. n., from Ourat. J. Verreaux, *tom. cit.* p. 39.
- Loxia albiventris*, sp. n., from Pekin. R. Swinhoe, *P. Z. S.* 1870, p. 437.
- Suthora suffusa*, sp. n., from the Upper Yangtszee, a small conspecies of *S. bulomachus* (*Zool. Rec. iii. p. 100.* *Id. op. cit.* 1871, p. 372).
- Suthora brunnea*, sp. n., from Yunan, also allied to *S. bulomachus*, but having no red on the wing. J. Anderson, *tom. cit.* pp. 211, 212.
- Suthora alphonsiana* and *S. gularis*, spp. nn., from Chinese Thibet. J. Verreaux, *N. Arch. Mus. vi. Bull. p. 35, vii. pp. 35, 36.*
- Suthora conspicillata*, sp. n., from Kokonoor. A. David, *tom. cit.* p. 14.

EMBERIZIDÆ.

- Emberiza leucocephala*, *E. cæsia*, *E. citrinella*, *E. aureola*, *E. cirrus*, *E. striolata*, *E. hortulana*, *E. miliaria*, and *E. chrysophrys* figured. R. B. Sharpe & H. E. Dresser, *B. Eur. pts. i.-ix.*
- Spodiospina*, subgen. nov., proposed for
- Emberiza cinerea*, Strickl.: M. T. von Heuglin, *Orn. N.-O. Afr. i. p. 660.* Its young described: E. Rey, *J. f. O.* 1871, p. 462.
- Emberiza tristrami*, sp. n., from North China, allied to *E. stracheyi*. R. Swinhoe, *P. Z. S.* 1870, p. 441, 1871, p. 388.
- Emberiza rustica* figured. J. Gould, *B. Gr. Br. pt. xx.*
- Emberiza schænicus* [qu. *E. intermedia*?] in India. A. O. Hume, *Ibis*, 1871, p. 38.
- Fringillaria saharae*, its habits. J. H. Gurney, jun., *tom. cit.* pp. 291-293.
- Pipilo carmani*, sp. n., from Socorro Island. G. N. Lawrence, "*Ann. Lyc. N. York*, x. p. 7," *P. Bost. Soc.* 7 June, 1871.
- Pipilo aleni*, sp. n., from Florida. E. Coues, *Am. Nat. v. p. 306*, note.

ALAUDIDÆ.

- Otocoris elwesi*, sp. n., from Sikkim. W. T. Blanford, *P. As. Soc. Beng.* 1871, p. 227.
- Melanocorypha leucoptera* figured. J. Gould, *B. Gr. Br. pt. xx.*
- Melanocorypha bimaculata* (Ménétr.), its synonymy and distribution: R. B. Sharpe, *Ann. N. H. (4) viii. pp. 179-181.* Figured: *Id.* & H. E. Dresser, *B. Eur. pt. ix.*
- Melanocorypha yeltoniensis* and *M. calandra* figured. *Id. op. cit.* pts. iv., v.

Alauda arvensis figured and the genus reviewed: *Ibid. op. cit.* pt. vi. In India: A. O. Hume, *Ibis*, 1871, p. 38.

Alauda guttata, sp. n., from Cashmir, allied to *A. gulgula*. W. E. Brooks, P. As. Soc. Beng. 1871, p. 210.

Alauda adamsi and *Galerita magna*, spp. nn., the former from Murdan, hitherto confounded with *A. raytal*, the latter from Yarkand. A. O. Hume, *Ibis*, 1871, pp. 405, 407.

Mirafra borneensis and *M. parva*, spp. nn., the former from Borneo, allied to *M. javanica*; the second from Flores, resembling the first, but much smaller. R. Swinhoe, *Ann. N. H.* (4) vii. p. 257.

Alauda wattersi and *Alaudula cheleensis*, spp. nn., the first from South Formosa and the Pescadores, allied to *A. cativox* and *A. sala* (*Zool. Rec.* vii. p. 56); the second from Northern China, allied to *A. pispoletta*. *Id.* P. Z. S. 1871, pp. 389, 390.

Alauda cristata, its fossil remains figured. A. Milne-Edwards, *Ois. Foss.* Fr. pl. 156, figs. 22, 23.

Galerita theclæ (*cf.* *Zool. Rec.* iii. p. 100) is a good species. E. F. von Homeyer, *Erinn. Vers. deutsch. Orn.* 1870, p. 47.

Certhilauda garrula, A. Smith, identified with *Anthus rufulus*, Vieill., and *C. subcoronata*, A. Smith, is *C. semitorquata*, ejusd. R. B. Sharpe, *Cat. Afr. B.* p. 71.

ICTERIDÆ.

Cassicus vitellinus (*Zool. Rec.* i. p. 85) is *C. flavicrissus*, Sclater (*P. Z. S.* 1860, p. 276). P. L. Sclater & O. Salvin, *Ibis*, 1871, p. 329.

Icterus laudabilis, sp. n., from Sta. Lucia, allied to *I. portoricensis*. P. L. Sclater, *P. Z. S.* 1871, p. 270, pl. xxi.

Xanthocephalus icterocephalus, its history. E. Coues, *Am. Nat.* v. pp. 195-200.

Xanthornis bullocki, its history. *Id. tom. cit.* pp. 678-682.

Sturnella ludoviciana in England. E. Newman, *Zool. s. s.* pp. 2557-2560.

STURNIDÆ.

Sturnus nitens, sp. n., from Cashmere. A. O. Hume, *Ibis*, 1871, p. 410.

Podoces humilis and *P. hendersoni*, spp. nn., from Yarkand. *Id. tom. cit.* pp. 408, 409.

Eulabes javanensis and its allies. *Ld. Walden, tom. cit.* p. 176.

Aplonis cinerascens, sp. n., from Rarotonga. G. Hartlaub & O. Finsch, *P. Z. S.* 1871, p. 29.

"*Lamprotorornis magnus*, Rosenb." [an *Calornis*?], sp. n., from Geelviuk Bay. H. Schlegel, *N. T. D.* iv. p. 18.

Gracula anais orientalis, consp. n., from New Guinea. *Id. tom. cit.* p. 52.

PARADISIIDÆ.

✓ MARSHALL, W. Sur les plumes caudales allongées des Oiseaux de Paradis. *Arch. Néerl.* vi. pp. 296-304.

(On the mode of growth of these feathers in several species.)

Paradisæa. On the distribution of various species in the Papuan subregion. H. Schlegel, *N. T. D.* iv. pp. 17, 49.

Sericulus xanthogaster, sp. n.; from New Guinea. *Id. tom. cit.* p. 50. [Referred to *Chlamydodera*. D. G. Elliot, *Ibis*, 1872, p. 113.]

"*Ptilorhynchus inornatus*, Rosenb.," sp. n., from the same locality. *Id. tom. cit.* p. 51. [Made type of *Amblyornis*, gen. nov. D. G. Elliot, *Ibis*, 1872, p. 113.]

ELLIOT, D. G. Review of the genus *Ptiloris* [qu. *Ptilorhis*?], Swainson. P. Z. S. 1871, pp. 580-584.

(A synonymic and descriptive list of the 4 species recognized, one of them, "*P. alberti*, G. R. Gray," from North Australia, and hitherto confounded with *P. magnificus*, being characterized as new.) Note on the same: G. R. Gray, *Ann. N. H.* (4) viii. pp. 365, 366.

CORVIDÆ.

Corvus cornix, *C. monedula*, and *C. frugilegus* in India: A. O. Hume, *Ibis*, 1871, p. 404. Pellets cast up by the last: H. Stevenson, *Tr. Norw. Soc.* 1870-71, pp. 89, 90.

Corvus larteti, *C. corax* and *Pyrrhocorax alpinus*, their fossil remains figured. A. Milne-Edwards, *Ois. Foss. Fr.* pls. 151, 152, 153, fig. 21, pl. 156, figs. 1-21, pl. 157.

Fregilus graculus figured. J. Gould, B. Gr. Br. pt. xix.

Fregilus graculus, var. *brachypus*, from China. R. Swinhoe, P. Z. S. 1871, p. 383.

Cyanura macrolopha, its history. E. Coues, *Am. Nat.* v. pp. 770-775.

Nucifraga caryocatactes. Complete account of its breeding in Europe. V. von Tschusi-Schmidhofen, *Verh. z.-b. Wien*, xxi. pp. 83-86. — Wiedemann, *Erinn. Vers. deutsch. Orn.* 1870, pp. 49-53.

COLUMBÆ.

COLUMBIDÆ.

DROSTE-HÜLSHOFF, FERD., Baron. Die Taubenpost. *Zool. Gart.* 1871, pp. 103-117.

(Gives the history of letter-carrying by Pigeons.)

"*Carpophaga westermanni*, Rosenb.," sp. n., from Jobie, differing slightly but constantly from *C. pinon*: H. Schlegel, *N. T. D.* iv. p. 27. Regarded as a local race, and called *C. pinon jobiensis*: *Id. tom. cit.* p. 26.

Ptilopus albocinctus, Wall., regarded as a local race, and called *P. cinctus florensis*. Another race from Lettie described as *P. cinctus lettiensis*. *P. rivolii* and *P. prasinorrhous*, their distribution. *Id. tom. cit.* pp. 20-22.

"*Ptilopus miqueli*, *P. speciosus*, *P. musschenbroeki* and *P. ornatus*, Rosenb.," spp. un.—the first from Geelvink Bay, allied to *P. rivolii*; the second represents the first in Soek; the third, also from Geelvink Bay, is allied to *P. viridis* (and is *P. viridis geelvinkiana*, Schlegel); the fourth, from New Guinea. *Id. tom. cit.* pp. 22-24, 52.

Ptilopus humeralis, *P. iozonus* and *P. coronulatus*, notes on. *Id. tom. cit.* pp. 24-26.

Ptilopus rarotongensis, sp. n., from Rarotonga, like *P. chrysogaster*, but

having a dark red pectoral patch. G. Hartlaub & O. Finsch, P. Z. S. 1871, pp. 30, 31.

Chrysæna victor, sp. n., from the Fiji Islands. J. Gould, P. Z. S. 1871, pp. 642, 643.

Pampusana. The non-emargination of the first primary considered an insufficient character for separating this group from *Leptoptila*. Notes on the eastern species, and description of

Leptoptila hoedti, sp. n., from Wetter Island. H. Schlegel, N. T. D. iv. p. 30.

Homoptila, gen. nov., allied to *Leptoptila*, but the first primary less attenuated. The type is

H. decipiens, sp. n., from Brazil. T. Salvadori, Atti Acc. Tor. vi. p. 131.

Turtur risorius in China. R. Swinhoe, P. Z. S. 1870, p. 446.

Turtur aldabranus, sp. n., from Aldabra Island, north of Madagascar. P. L. Scater, op. cit. 1871, pp. 623, 692, 693, pl. lxxiii.

"*Zenaidura graysoni*, Baird, Ann. Lyc. N. York, x. p. 17," and

"*Chamaepelia pallescens*, Baird," spp. nn.; the first from the Tres Marias and Socorro Islands, the last from the latter locality only. G. N. Lawrence, P. Bost. Soc. 7 June, 1871.

DIDUNCULIDÆ (?).

Otidiphaps nobilis (Zool. Rec. vii. p. 58) figured. J. Gould, B. As. pt. xxiii.

GALLINÆ.

CRACIDÆ.

BURMEISTER, H. Remarks on Messrs. Scater and Salvin's Synopsis of the *Cracidæ* [Zool. Rec. vii. p. 58]. P. Z. S. 1871, pp. 701, 702.

(Chiefly relates to the distribution of some of the species.)

PHASIANIDÆ.

ELLIOT, D. G. A Monograph of the *Phasianidæ*, or Family of Pheasants. 1871. Parts II.-V. Imp. fol.

This magnificent work (Zool. Rec. vii. p. 59) maintains its character. [The species figured are:—Part ii. *Lophophorus inpeyanus*, *Puerasia xanthospila*, *Phasianus reevesi*, *P. shawi*, *Euplocamus swinhoii*, *E. ignitus*, *Gallus sonnerati*, *Cerionis temmincki*, *Polyplectrum thibetanum*, *P. chalcurom*, *Ithaginis geoffroyi*, *Pavo muticus*, *Numida meleagris*, *N. plumifera* and *Agelastes meleagrides*. Part iii. *Phasianus insignis*, *P. versicolor*, *P. elegans*, *Argus giganteus*, *Euplocamus nobilis*, *E. lineatus*, *E. erythrophthalmus*, *Tetraophasis obscurus*, *Thaumalea picta*, *Meleagris ocellata*, *Cerionis satyra*, *Polyplectrum bicalcaratum*, *Acryllium vulturinum*, *Numida coronata* and *Phasidus niger*. Part iv. *Phasianus mongolicus*, *P. colchicus*, *P. wallichi*, *P. formosanus*, *Cerionis caboti*, *Euplocamus pyrrhonotus*, *Lophophorus sclateri*, *Gallus varius*, *Meleagris gallopavo*, *Ithaginis cruentus*, *Crossoptilum mantchuricum*, *Polyplectrum emphanum*, *Numida granti* and *N. ptilorhyncha*. Part v. *Meleagris mexicana*, *Phasianus decollatus*, *P. torquatus*, *Crossoptilum drouyni*, *C. auritum*, *Gallus lafayettii*, *Euplocamus melanotus*, *E. andersoni*, *Pavo cristatus*, *Cerionis melanocephala*,

Thaumalea obscura, *Pucrasia duvauceli*, *Numida cristata*, *N. pucherani*, with feathers of *Argus ocellatus* and *A. bipunctatus*.]

Lophophorus obscurus, sp. n., from Thibet. J. Verreaux, N. Arch. Mus. vi. Bull. pp. 33-35.

Phasianus elegans, Elliot (1 Oct. 1870) (Zool. Rec. vii. p. 59), is "*P. sladeni*, Anders.," Elliot (9 June, 1870) (Zool. Rec. loc. cit.). J. Anderson, P. Z. S. 1871, pp. 214, 215.

Euplocamus andersoni, sp. n., from Burma, allied to *E. lineatus* and *E. nycthemerus*. A synopsis of the genus is added. D. G. Elliot, *tom. cit.* pp. 137, 138.

Cerionis caboti, ad. described. T. Salvadori, *tom. cit.* pp. 695, 696.

Crossoptilum cerulescens (Zool. Rec. vii. p. 59) is the true *Phasianus auritus*, Pall.: R. Swinhoe, *tom. cit.* p. 399. Synopsis of the genus: P. L. Sclater, *tom. cit.* p. 495.

Polyplectrum chinquis (= *P. thibetanum*, Elliot, *ut supra*) figured: J. Gould, B. As. pt. xxiii. Note on its young by Mr. Bartlett: D. G. Elliot, *l. s. c.*

Argus bipunctatus, sp. n., described from a single feather: T. W. Wood, Ann. N. H. (4) viii. pp. 67, 68. *A. ocellatus*, the four feathers, on which the supposed species is founded, described: D. G. Elliot, *tom. cit.* pp. 119, 120. [Cf. *op. cit.* x. p. 67.]

Gallus domesticus, etymology of its name, and bibliography of the species. W. Stricker, Zool. Gart. 1871, pp. 229-232.

Numida granti, sp. n., from Ugogo, Central Africa. D. G. Elliot, P. Z. S. 1871, p. 584.

Meleagris gallopavo, origin of the domestic form. J. A. Allen, Bull. Mus. C. Z. ii. pp. 343-352.

TETRAONIDÆ.

Bambusicola fytchi, sp. n., from Yunan. J. Anderson, P. Z. S. 1871, p. 214, pl. xi.

Tetrao urogallus, *T. tetrix*, *Lagopus scoticus*, and *L. mutus* in Perthshire. Notes on. R. Paton, Scot. Nat. i. pp. 112-115.

Tetrao tetrix figured. J. Gould, B. Gr. Br. pt. xx.

Lagopus hemileucurus and *Bonasa betulina* figured. R. B. Sharpe & H. E. Dresser, B. Eur. pts. vii., ix.

Lagopus rupestris and its allies. A. Newton, P. Ac. Philad. 1871, p. 96.

Perdix barbata, *P. cinerea*, and *Coturnix communis* (ad. et pull.) figured: J. Gould, B. As. pt. xxiii., and B. Gr. Br. pt. xix., xx. Northward extension of the two latter: V. Russow, SB. Ges. Dorp. 23 Feb. 1870. The last breeding in North Uist: J. P. W. Orde, Ibis, 1871, p. 112.

PTEROCLIDÆ.

Syrrhaptes paradoxus. Marco Polo's "Barguerlac" identified with it: H. Yule, 'Book of Ser Marco Polo,' i. pp. 239, 240. Breeding in confinement: F. Kjärbölling, Zool. Gart. 1871, p. 22.

TURNICIDÆ.

Turnix africanus figured. J. Gould, B. Gr. Br. pt. xx.

Arctoturnix blakistoni and *Heimipodius viciarius*, spp. nn., from China. The

former, before mistaken for *Turnix ocellata*, is most nearly allied to *T. pugnax*; the latter, hitherto confounded with two or three other species, is very similar to *T. blanfordi*. R. Swinhoe, P. Z. S. 1871, pp. 401, 402.

MEGAPODIIDÆ.

Talegalla lathamii, notes on its breeding. J. M. Cornély, Bull. Soc. Acclim. viii. pp. 528-536.

TINAMIDÆ.

Crypturus. The characters of its egg-shell, as affording evidence of its systematic place. W. von Nathusius, Z. wiss. Zool. 1871, pp. 330-355.

GRALLÆ.

RALLIDÆ.

Corethrua insularis (Zool. Rec. vii. p. 60), ♂ and ♀, figured. R. B. Sharpe, P. Z. S. 1871, p. 315, pl. xxxii.

Rallacula, gen. nov., the type being

R. rubra, sp. n., from New Guinea. H. Schlegel, N. T. D. iv. p. 55.

Porzana [olim *Corethrua*] *guatemalensis* (Zool. Rec. ii. p. 129) is not *P. concolor*: G. N. Lawrence, Ibis, 1871, p. 370. Hardly separable: O. Salvin, *oc. cit.*

Porphyrio smaragdonotus breeding in confinement. A. E. Brehm, J. f. O. 1871, pp. 34-39.

Parcudiastes, gen. nov., probably flightless, the type being

P. pacificus, sp. n., from Savai. G. Hartlaub & O. Finsch, P. Z. S. 1871, pp. 25, 26, pl. ii.

Fulica dejardini, sp. n., foss., founded on the lower half of a femur from the Crag. J. P. van Beneden, Bull. Ac. Belg. xxxii. p. 218, pl. fig. 8.

Aptornis defossor, sp. n., from the Middle Island of New Zealand. R. Owen, Tr. Z. S. vii. pp. 353-366, pls. 40, 41, 43, 44.

Aptornis [olim *Dinornis*] *otidiformis*, pelvis figured. *Id. tom. cit.* pp. 366-369, pl. 42, figs. 1-3, pl. 43, figs. 1-4.

Notornis, pelvis and femur figured. *Id. tom. cit.* pp. 369-371, 373, 374, pl. 42, figs. 5, 6, pl. 43, fig. 9.

SCOLOPACIDÆ.

Scolopax rosenbergi, "sp. n.," from New Guinea. H. Schlegel, N. T. D. iv. pp. 54, 55. Identical with *S. rochussenii* (Zool. Rec. ii. p. 130). *Id. loc. cit.*

Gallinago heterocerca, sp. n., from the Baikal. J. Cabanis, J. f. O. 1870, p. 235; L. Taczanowski, *tom. cit.* p. 311.

Scolopax major and *S. gallinago*, their non-vocal breeding-notes. V. Russow, SB. Ges. Dorp. 23 Feb. 1870.

Scolopax sabinii, recent specimen exhibited. J. E. Harting, P. Z. S. 1871, p. 39.

Macrorhamphus griseus, its egg. A. Newton, *tom. cit.* p. 56.

Tringa bonapartii near Barnstaple: M. A. Mathew, Zool. s. s. p. 2443. At Eastbourne: B. Bates, *tom. cit.* p. 2444.

Actodromas bairdi, its egg. A. Newton, P. Z. S. 1871, p. 57

Tringa temmincki and *T. minuta* figured, and a review of the smaller species of the genus given. R. B. Sharpe & H. E. Dresser, B. Eur. pt. vii.

Calidris arenaria, its egg figured. A. Newton, P. Z. S. 1871, pp. 56, 546, 547, pl. iv. fig. 2.

Terekia cinerea figured. R. B. Sharpe & H. E. Dresser, B. Eur. pt. iv.

Totanus stagnatilis and *T. canescens* figured. *Iid. op. cit.* pts. i., v.

Totanus flavipes again in England. E. H. Rodd, Zool. s. s. pp. 2807, 2808.

Totanus calidris and *Machetes pugnax* figured. J. Gould, B. Gr. Br. pt. xix.

Numenius phaeopus figured. *Id. op. cit.* pt. xx.

Numenius tenuirostris figured. R. B. Sharpe & H. E. Dresser, B. Eur. pt. iii.

Numenius arquata, *N. australis*, and "*N. nasicus*, Temm.," in Eastern Siberia. L. Taczanowski, J. f. O. 1871, pp. 56-61, 395, 396 [cf. P. Z. S. 1871, pp. 409-411].

Numenius borealis in Ireland. V. Brooke, P. Z. S. 1871, p. 299.

Numenius borealis and *N. hudsonicus*, their eggs figured. A. Newton, *tom. cit.* pp. 56, 57, pl. iv. figs. 1, 3.

Rupelornis, gen. nov., foss., founded on the lower part of a tibia from the Rupelmonde clay. The type is called

R. definitus, J. P. van Beneden, Bull. Ac. Belg. xxxii. pp. 217, 218, pl. fig. 7.

CHARADRIIDÆ.

OGDEN, J. A. Synopsis of the genus *Chettusia* (*Lobivanellus*), with a description of a new species. P. Ac. Philad. 1871, pp. 194-196, pl. i. *

(A short sketch, including 16 species; one being

C. nivifrons, sp. n., from Fazoglou. J. A. Ogden, *ut supra*, p. 196.)

Chettusia leucura figured. R. B. Sharpe & H. E. Dresser, B. Eur. pt. ii.

Limnetes [potius *Deflippia* (Zool. Rec. iii. p. 110, vii. p. 61)] *crassirostris* figured, with details of structure: M. T. von Heuglin, Orn. N.-O. Afr. tab. xxxiii. In South Africa: E. L. Layard, Ibis, 1871, p. 106.

Vanellus selysi, sp. n., foss., founded on a fragmentary humerus from the Rupelmonde clay. J. P. van Beneden, Bull. Ac. Belg. xxxii. pp. 216, 217, pl. fig. 2.

Charadrius phuvialis, *C. fulvus*, and *Squatarola helvetica* figured. R. B. Sharpe & H. E. Dresser, B. Eur. pts. vi., ix.

Ægialitis minor figured. J. Gould, B. Gr. Br. pt. xix.

Chionis minor, its egg figured. A. Newton, P. Z. S. 1871, p. 57, pl. iv. fig. 7.

Hæmatopus osculans, sp. n., from China, intermediate between *H. ostralegus* and *H. longirostris*. R. Swinhoe, *tom. cit.* p. 405.

OTIDIDÆ.

Otis tarda in England. W. B. Tegetmeier, P. Z. S. 1871, p. 1. E. Newman, Zool. s. s. pp. 2473-2477, 2510-2512.

GRUIDÆ.

Marco Polo's second kind of Crane conjectured to be *Grus leucogeranus*;

* The plate not yet seen by the Recorder.

but if not, then a distinct species, to be called *G. polii*. H. Yule, 'Book of Ser Marco Polo,' i. p. 262.

Grus leucauchen breeding in confinement, ad. & juv. figured. JB. Gen. Amst. 1871, pp. 199-201.

RHINOCETIDÆ.

Rhinocetus jubatus, its dermal and visceral anatomy compared with *Eury-pyga* (cf. Zool. Rec. v. p. 106) and also with *Cancroma*. J. Murie, Tr. Z. S. vii. pp. 465-492, pls. 56, 57.

ARDEIDÆ.

Ardea melanocephala figured. R. B. Sharpe & H. E. Dresser, B. Eur. pt. iii.

Ardea phumbea, sp. n. (allied to *A. scapularis* and *A. rufiventris*), and *A. violacea*, var., from the Galapagos. C. J. Sundevall, P. Z. S. 1871, pp. 125, 127-129.

Ardea rufiventris figured. T. Ayres, Ibis, 1871, p. 265, pl. ix.

Ardeola novæ-zelandiæ, sp. n., from New Zealand: A. C. Purdie, Tr. N. Z. Inst. iii. p. 99. Is the Australian *A. pusilla*: T. H. Potts, loc. cit.

Bubulcus russatus and *Ardetta minuta* figured. J. Gould, B. Gr. Br. pt. xx.

Cancroma, its dermal and visceral anatomy. J. Murie, Tr. Z. S. vii. pp. 465-492, pls. 56, 57.

CICONIIDÆ.

Mycteria australis. Another version of former notes [Zool. Rec. vii. p. 61]. C. Horne, Ibis, 1871, pp. 110-112.

Ciconia abdimii in Europe. H. Saunders, tom. cit. p. 393.

Ciconia alba (ad. & pull.) and *C. nigra* figured: J. Gould, B. Gr. Br. pt. xx. Northward extension of the first: V. Russow, SB. Gen. Dorp. 23 Feb. 1870.

Ibis propinqua, sp. n., from China, allied to *I. melanocephalus*. R. Swinhoe, P. Z. S. 1870, p. 428; 1871, p. 411.

ANSERES.

PHÆNICOPTERIDÆ.

Phœnicopterus roseus breeding in Spain. H. Saunders, Ibis, 1871, pp. 394-396.

ANATIDÆ.

Anser. The European species differentiated. A. Newton, P. Ac. Philad. 1871, p. 98.

Anser cinereus, var. *rubrirostris*, and *A. segetum*, var. "*serrirostris*, Gould,' sp. (P) n., from China. R. Swinhoe, P. Z. S. 1871, pp. 416, 417.

Anser albifrons (ad. et pull.) and *A. brachyrhynchus* figured. J. Gould, B. Gr. Br. pt. xix.

Anser ruficollis in England: J. E. Harting, P. Z. S. 1871, p. 102. From Astrabad: C. Dode, tom. cit. p. 480.

Anser leucopsis in North America. G. N. Lawrence, Am. Nat. v. pp. 10, 11.

Chenalopex ægyptiacus in Westphalia. H. Landois, Zool. Gart. 1871, p. 251.

1871. [VOL. VIII.]

Anser scaldi, *Cygnus herenthalsi*, and *Anas creccoides* [nec King, nec Brehm], spp. nn., foss.; the first two from the Crag, the third, portions of which are figured, from the Rupelmonde clay. J. P. van Beneden, Bull. Ac. Belg. xxxii. pp. 218, 217, pl. figs. 3-6.

Chen hyperboreus, *Somateria v-nigrum*, and *Clangula albeola*, their eggs described. A. Newton, P. Z. S. 1871, pp. 57, 58.

Cygnus (*Coscoroba*) *davidi* (Zool. Rec. vi. p. 99) described. R. Swinhoe, op. cit. 1870, p. 430, 1871, p. 416.

Cygnus uniwini, sp. ? n., from India. A. O. Hume, Ibis, 1871, pp. 412, 413.

Cygnus nigricollis breeding in Europe. JB. Zool. Gen. Amst. 1871, pp. 196-198.

Cygnus, sp., foss. in New Zealand. A. C. Purdie, Tr. N.-Z. Inst. iii. p. 100.

Anas punctata, Cuv. (nec Burch.), ♀ believed to have the same form of trachea as ♂, and *Virago* accordingly suggested as the name, should the species be made the type of a new genus. A. Newton, P. Z. S. 1871, pp. 649-651, figs. *

Mareca penelope, *Spatula clypeata*, *Fuligula cristata*, and *Nyroca ferina* are figured. J. Gould, B. Gr. Br. pt. xix.

Querquedula crecca, *Q. formosa*, *Q. falcata*, and *Q. circia* figured. R. B. Sharpe & H. E. Dresser, B. Eur. pts. i., ii., v.

Somateria stelleri and *S. mollissima* figured. *Ibid.* op. cit. pts. iii., iv.

Anas stelleri supposed to breed in Russian Lapland. A. G. Nordvi, J. f. O. 1871, pp. 208, 209.

Somateria dresseri, sp. n., from North America, hitherto confounded with *S. mollissima* [cf. Zool. Rec. vi. p. 100]. R. B. Sharpe, Ann. N. H. (4) viii. pp. 51-53.

Micropterus patachonicus is *M. cinereus*, juv., which loses the power of flight as it grows older: R. O. Cunningham, P. Z. S. 1871, p. 262. Its anatomy: *Id.* Tr. Z. S. vii. pp. 493-501, pls. 58-62.

LARIDÆ.

SCLATER, P. L., & SALVIN, O. A Revised List of the Neotropical *Laridæ*. P. Z. S. 1871, pp. 564-580, figs.

A very excellent paper, treating of 32 species, belonging to the subfamilies *Rhynchopinae*, *Sternae*, *Larinae*, and *Lestrudinæ*, which are divided into four categories:—Tropical (15), Antarctic (4), Arctic (9), and Tropicopolitan (4), according to their range. Their synonymy receives the authors' accustomed care, and many rectifications are made. No new species are described; but the heads of *Sterna maxima*, *S. galericulata*, *Larus heermanni*, *L. belcheri*, and *Leucophaeus scoresbii* are figured. The name *Chroicocephalus* should probably be spelled *Chroocephalus*.]

Larus cirrhocephalus, its habits. W. H. Hudson, *tom. cit.* pp. 4-7.

Larus raemdoncki, sp. n., foss., from the Rupelmonde clay and Édegheem nearly the size of *L. argentatus*. J. P. van Beneden, Bull. Ac. Belg. xxxii. p. 216, pl. fig. 1.

Larus fuscus figured. J. Gould, B. Gr. Br. pt. xix.

* [In the explanation of figs. 1 & 2 "beneath" should be read for "above." —ED.]

Chroicocephalus saundersi, sp. n., from China. R. Swinhoe, P. Z. S. 1871, p. 274, pl. xxii.

Xema sabini, *Chroicocephalus philadelphia*, and *Larus franklini*, their eggs figured. A. Newton, *tom. cit.* p. 57, pl. iv. figs. 5, 6, 4.

Larus minutus and *Sterna fluviatilis* figured. R. B. Sharpe & H. E. Dresser, B. Eur. pts. iv., vii.

Sterna macroptera (Zool. Rec. iii. p. 113) is *S. fluviatilis*, vest. hiem. *Iid. loc. cit.*

Sternula placens, sp. n., from Torres Straits, allied to *S. minuta* and *S. nereis*. J. Gould, Ann. N. H. (4) viii. pp. 192, 193.

Gelochelidon anglica figured. *Id.* B. Gr. Br. pt. xx.

Sterna leucoptera and *S. fissipes* in S. Africa. T. Ayres, Ibis, 1871, p. 267.

"*Haliplana fuliginosa*, var. *crissalis*, Baird," from the Tres Marias and Socorro Islands, has the lower tail-coverts tinged with ash-colour. G. N. Lawrence, P. Bost. Soc. 7 June, 1871.

PELECANIDÆ.

SCLATER, P. L. Additional remarks on certain Species of Pelicans. P. Z. S. 1871, pp. 631-634, pl. li.

(In continuation of the former paper (Zool. Rec. v. p. 110), as well as remarks on those of Mr. Elliot and Prof. du Bocage (*op. cit.* vi. p. 101, vii. p. 63). Ten species are recognized, and *Pelecanus minor* said to occur in Europe. The plate represents *P. sharpii*; and its head, as well as that of *P. philippensis*, is also figured.)

Pelecanus, sp. ? A second humerus (*cf.* Zool. Rec. v. p. 110) found in Cambridgeshire. A. Newton, *tom. cit.* pp. 702, 703.

Pelecanus onocrotalus in Courland. V. Russow, SB. Ges. Dorp. 23 Feb. 1870.

Sula bassana in Hanover. Hr. von Minnigerode, J. f. O. 1871, p. 73.

SPHENISCIDÆ.

Spheniscus mendiculus, sp. n., from the Galapagos, allied to *S. demersus*. C. J. Sundevall, P. Z. S. 1871, pp. 129, 130.

PODICIPIDÆ.

Podiceps cristatus in New Zealand. W. T. L. Travers, Tr. N.-Z. Inst. iii. pp. 113-116.

ALCIDÆ.

Alca impennis, an unrecorded egg of. T. H. Potts, Tr. N.-Z. Inst. iii. pp. 109, 110.

STRUTHIONES.

STRUTHIONIDÆ.

Struthio australis (Zool. Rec. v. p. 112), its domestication at the Cape. M. Lanen, Bull. Soc. Acclim. viii. pp. 524-527.

RHEIDÆ.

Rhea americana and *R. darwini*, their osteology. R. O. Cunningham, P. Z. S. 1871, pp. 105-110, pls. vi., vi. a.

CASUARIIDÆ.

Casuarius australis (Zool. Rec. vi. p. 103), its osteology. W. H. Flower, P. Z. S. 1871, pp. 32-35.

Casuarius kaupi distinct from *C. uniappendiculatus* [cf. Zool. Rec, iii. p. 116]. P. L. Sclater, *tom. cit.* p. 627.

"*Casuarius papuanus*, Rosenb.," sp. n., from the northern peninsula of New Guinea, allied to *C. bennetti*. H. Schlegel, N. T. D. iv. p. 54.

DINORNITHIDÆ.

Dinornis. For Prof. Owen's series of papers on birds of this family see "ANATOMY AND PHYSIOLOGY."

ÆPYORNITHIDÆ.

Æpyornis, its egg-characters: W. Nathusius, Z. wiss. Zool. 1871, pp. 330-355. Egg figured: H. Yule, 'Book of Ser Marco Polo,' ii. frontispiece.

APTERYGIDÆ.

Apteryx, its egg-characters. W. Nathusius, *l. c.*

Apteryx mantelli identified with *A. australis*. P. L. Sclater, P. Z. S. 1871, p. 496.

Apteryx australis, its brain and some of the nerves and muscles of the head. R. Owen, Tr. Z. S. vii. pp. 381-385, pls. 45, 46.

SAURURÆ.

ARCHÆOPTERYGIDÆ.

Archæopteryx. A figure resembling this singular form in a Chinese 'Materia Medica.' R. Swinhoe, P. Z. S. 1871, p. 423.

REPTILIA

BY

ALBERT GÜNTHER, M.A., M.D., PH.D., F.R.S.

THE GENERAL SUBJECT. NOTES AND FAUNÆ.

DARWIN, C. The Descent of Man, and Selection in relation to Sex. London: 1871. 16mo, vol. i. pp. 423, vol. ii. pp. 475, with numerous woodcuts.

Part of chapter xii. (pp. 24-37) contains the most complete account of the secondary sexual characters of Reptiles and Amphibians that has ever been published. We shall refer in the special part of this Record to some of the facts which are not generally known, or which have been illustrated by Mr. Darwin. The author comes to the conclusion that sexual selection seems to have played almost as important a part among Reptiles as among Birds. But the less conspicuous colours of the females, in comparison with those of the males, cannot be accounted for, as in the case of birds, by the exposure of the females to danger during incubation. [*Cf. supra*, pp. 1, 2, 25-27.]

According to a statement by Dr. J. ANDERSON, the Indian Museum in Calcutta received 255 species during the last four and a half years; they illustrate 113 genera, and number in all 1768 specimens. J. A. S. B. 1871, p. 12.

Great Britain. "Mammalia and Reptilia of Norfolk," by T. SOUTHWELL. Zoologist, 1871, pp. 2751-2760. A paper of local interest.

Luxemburg. A. DE LA FONTAINE gives an account of the Reptiles and Amphibians of Luxemburg—2 Tortoises (extinct), 4 Lizards, 6 Snakes, 14 Batrachians. Public. de l'Institut. de Luxemb. xi. pp. 49-91.

Pomerania. "Die Wirbelthiere Pommerns," by T. HOLLAND. Stolp: 1871. 8vo, pp. 119. The author enumerates 6 Reptiles and 12 Amphibians. A work of local interest.

Réunion. An Agamoid Lizard, which the author names *Agama (Calotes) versicolor* [but is probably a *Bronchocæle* (? *B. cristatella*)], has been recently introduced from Java into this island accidentally, and is rapidly increasing in numbers. VINSON, Trans. R. Soc. Maurit. 1871, p. 33.

India. The following contributions to Indian Herpetology have been made:—"A list of the Reptilian accession to the Indian Museum, Calcutta, from 1865 to 1870, with a description of some new species," by J. ANDERSON, J. A. S. B. 1871, pp. 12-38. "Notes on some Indian and Burmese Ophidians," by F. STOLICZKA, *ibid.* pp. 421-445, pls. 25 & 26. "On some Indian Reptiles," by J. ANDERSON, P. Z. S. 1871, pp. 149-211, contains some important information regarding Blythian types, and corrections of Mr. Theobald's 'Catalogue.'

Borneo. Prof. PETERS has made a valuable contribution to our knowledge of the herpetological fauna of Sarawak, based on the materials collected by the Marquis J. Doria. He describes as new 8 Lizards, 4 Snakes, and 5 Frogs. MB. Ak. Berl. 1871.

Australia. Mr. KREFFT has published a pamphlet, 'Australian Vertebrata, Fossil and Recent' (8vo, pp. 96, place and date of publication?), containing a nominal list of the Vertebrates of this fauna, some being accompanied with short notes on their distribution and habits. He enumerates 12 Tortoises, some 130 Lizards, about 70 Snakes, and 42 Frogs.

New Zealand. "A list of the Lizards inhabiting New Zealand, with descriptions," by W. BULLER, in T. N. Z. Inst. iii. pp. 4-11 & 56, contains 13 species, three of which are considered to be new.

Patagonia. 'Notes on the Natural History of the Strait of Magellan and West Coast of Patagonia, made during the Voyage of H.M.S. 'Nassau,' in the years 1866-69,' by R. O. CUNNINGHAM (Edinb. 1871, 8vo, pp. 517), contain numerous observations on the occurrence of Reptilia collected by the author on the coasts of the southernmost parts of South America. These observations are collected in a separate paper, "Notes on the Reptiles, Amphibia, Fishes, &c. obtained during the Voyage of H.M.S. 'Nassau,'" in Trans. Linn. Soc. xxvii. 1871, pp. 465-468.

Peru. Prof. PETERS has reported on a collection made in the Highlands of Peru:—9 Lizards, 16 Snakes, and 10 Frogs, several being described as new. MB. Ak. Berl. 1871, pp. 397-404.

ANATOMICAL PUBLICATIONS.

CLASON, E. Die Morphologie des Gehörorgans der Eidechsen. Hasse's Anatom. Stud. 1871, pp. 300-376, pls. 16 & 17.

- FRITSCH, A. Zur Anatomie der Elephanten-Schildkröte (*Testudo elephantina*). Abhandl. böhm. Ges. Wiss. iv. 1871, pp. 18, with 3 plates.
- HASSE, C. Das Gehörorgan der Schildkröten. Hasse's Anatom. Studien, 1871, pp. 225-299, pls. 11-15.
- . Das knöcherne Labyrinth der Frösche. Hasse's Anatom. Studien, 1871, pp. 317-416, pl. 18.
- HUMPHRY, G. M. The muscles and nerves of the *Cryptobranchus japonicus*. J. Anat. & Physiol. 1871, pp. 1-61, pls. 1-4.
- MIVART, ST. G. On the Vertebrate skeleton. Trans. Linn. Soc. xxvii. 1871, pp. 369-392, pl. 53. See p. 4.
- PARKER, W. K. On the structure and development of the skull of the Common Frog (*Rana temporaria*). Phil. Trans. vol. clxi. 1871, pp. 137-211, pls. 3-10. (Abstract in Proc. Roy. Soc. 1871, pp. 246-248.)
- SCHULZE, F. E. Ueber die Sinnesorgane der Seitenlinie bei Fischen und Amphibien. Arch. mikrosk. Anat. vi. p. 62, pls. 4-6. [On the organs of sense in the lateral line in Fishes and Amphibians.] Abstract in Arch. Zool. expériment. et génér. i. 1872, pp. i-iv.
- SIRENA, S. Ueber den Bau und die Entwicklung der Zähne bei den Amphibien und Reptilien. Verh. phys.-med. Ges. Würzb. 1871, ii. pp. 125-144, pl. 11.

CHELONIA.

- Testudo elephantina*. Its anatomy. Fritsch, Abhandl. böhm. Ges. Wiss. iv. 1871, pp. 18, pls. 1-3.
- Testudo falconeri*. Notes by Dr. Gray in reply to Mr. Theobald, P. Z. S. 1871, p. 515.
- Testudo phayrei*. Notes and figure by Anderson, P. Z. S. 1871, pp. 425-429. —Critical notes on this paper by Gray, A. & M. N. H. 1871, vii. pp. 445-447.
- Testudo phayrei*=*Scapia falconeri*, Stoliczka, A. & M. N. H. 1871, viii. p. 212.—Dr. Gray reviews the history of this Tortoise, *ibid.* pp. 320-324.
- Testudo chilensis* [see Zool. Rec. vii. p. 69]. Some further notes on its nomenclature and habitat, Gray, A. & M. N. H. 1871, vii. p. 15, viii. p. 70.—Dr. Philippi writes to Mr. Selater that no Tortoise whatever had yet been found in Chili, and that the typical specimens of *T. chilensis* had been collected by Mr. Weisshaupt in the vicinity of Mendoza. P. Z. S. 1871, pp. 480, 744. [The Recorder begs leave to state that this is in direct contradiction to the statement made to him by the collector, who said that he had collected these specimens on the west coast.]
- Manouria emys*. Dr. Gray brings the synonymy down to the latest date P. Z. S. 1871, p. 517.

- Damonia oblonga*, sp. n., Gray, A. & M. N. H. 1871, viii. p. 367, Batavia.
- Rhinoclemmys mexicana* figured by Gray, P. Z. S. 1871, p. 296, pl. 28.
- Pangshura flaviventer* from the Jumna, Anderson, P. Z. S. 1871, p. 153.
- Cinosternum leucostomum*. Notes by Sclater, P. Z. S. 1871, p. 745.
- Chelemys macquaria*. Remarks on specimens from the Burnett River by Gray, A. & M. N. H. 1871, viii. p. 291.
- Chelemys krefftii*, sp. n., Gray, l. c. p. 366, Burnett's River, Queensland.
- Chelemys australis* = *Hydraspis australis* (Gray, 1840), Gray, l. c.
- Elseya latisternum*. Note on specimens from the Burnett River by Gray, l. c. p. 292.
- Euchelymys* [*Euchelemys*], g. n., Gray, l. c. p. 117, differs from *Chelemys* and *Elseya* in having two barbels. *Eu. sulcifera* and *Eu. spinosa*, spp. nn., from North Australia, *ibid.* p. 118.
- Pelomedusa*. On the sternum of a specimen from the Upper Zambesi (*P. gehafie*?). Sclater, P. Z. S. 1871, p. 325, with woodcut.
- Pelomedusa subrufa*. Dr. Gray draws attention to the fact that this African species colonizes in South America. Cornalia's *Pentonyx americana*, from New York, is also a young of the same Tortoise. A. & M. N. H. 1871, viii. p. 140.
- Podocnemis unifilis* (Trosch.) is the young of *P. dumeriliana*. Gray, l. c. p. 68.
- Podocnemis unifilis*. Notes on this and allied species by Sclater, P. Z. S. 1871, p. 745.
- Podocnemis expansa* and *P. dumeriliana*. Ear-openings figured by Sclater, c. p. 747.
- Bartlettia pitipii* (Gray) = *Emys erythrocephala* (Spix), according to Sclater, who figures the sternum. L. c. p. 747.
- Trionyx phayrei* (Theobald) = *T. jeudi* (Gray), according to Anderson, P. Z. S. 1871, p. 154.—Dr. Gray states that Dr. Anderson has examined a *Trionyx* distinct from *T. phayrei*, A. & M. N. H. 1871, viii. pp. 83–89.—Reply from Dr. Anderson, *ibid.* pp. 324–330.
- Dermatochelys coriacea*. An example, 9 feet long, on the coast of New South Wales. Krefft, Austral. Vertebr. p. 39.

CROCODILIA.

- Crocodylus*. On the distribution of the Indian species. A. Anderson, Zoologist, 1871, pp. 2862–2865.
- Gavialis gangeticus* is also found in the Mahanadi River. Forsyth, Highlands of Central India, p. 42.

LACERTILIA.

- Varanus heraldicus*. Note on the male organs by Dr. Gray, A. & M. N. H. 1871, vii. pp. 283–286, with two woodcuts.
- Varanus lunatus* common in the Agra district. Anderson, P. Z. S. 1871, p. 155.
- Tejus rufescens*, sp. n., Günther, P. Z. S. 1871, p. 541, Mendoza.—The heads of this species and *T. teguixin* are figured.
- Ameiva pleurotaenia*, sp. n., = *A. bifrontata* (Cope, part.), Peters, MB. Ak. Berl. 1871, pp. 398, 652, Pebas.

- Tachydromus haughtonianus* described by Anderson, P. Z. S. 1871, p. 156.
- Pseudopus gracilis*. On its occurrence, Anderson, l. c. p. 156.
- Chalcides (Hapalolepis) abendrothii*, subg. et sp. n., Peters, MB. Ak. Berl. 1871, p. 399, Peruvian Amazons.
- Tretioscincus laevicaudus*, sp. n., Cope, P. Am. Phil. Soc. 1870, p. 557, Nicaragua.
- Scincus mitranus*, sp. n., Anderson, P. A. S. B. 1871, p. 115, Arabia.
- Hinulia variegata* described as a new species from New Zealand by Buller, T. N. Z. Inst. iii. p. 5, pl. 2. fig. 3.
- Mocoo striata* described as a new species from New Zealand by Buller, l. c. p. 6, pl. 2. f. 2.
- Lygosoma punctulatum*, sp. n. Peters, MB. Ak. Berl. 1871, p. 646, North-east Australia.
- Lygosoma (Mocoo) nitens*, sp. n., Peters, l. c. p. 573, Sarawak.
- Plestiodon scutatus* (Theobald) = *Eurylepis taniolatus* (Blyth) = *Mabouia taniolata* (Anderson). Anderson, P. A. S. B. 1871, p. 184.
- Mabouia blythiana*, sp. n., Anderson, l. c. p. 186, Amritzur ?
- Eumeces*. Notes on *Eu. trivittatus*, *Eu. sikkimensis*, *Eu. indicus*, and *Eu. albopunctatus*, by Anderson, P. Z. S. 1871, p. 158.
- Mabuia*. *Copeoglossum cinctum* (Tschudi) proves to be a Lizard of this genus, and is perhaps identical with *M. cepedii* (Gray). Peters, MB. Ak. Berl. 1871, p. 400.
- Mabuia fulgida* (Cope) = *Euprepes spilonotus* (Wiegman), and *Mabuia cuprescens* (Cope) = *Euprepes semiteniatus* (Wiegman). Peters, l. c.
- Euprepes (Mabuia) parietalis*, sp. n., Peters, l. c. p. 572, Sarawak.
- Riopa anguina* described by Anderson, P. Z. S. 1871, p. 159.
- Euprepes (Riopa) punctatostriatus*, sp. n., Peters, l. c. p. 31, Singapore.
- Amphixestus*, g. n., Peters, l. c. p. 573. Differs from *Tropidophorus* in having smooth scales and a single large præanal.—*Amphixestus beccarii*, sp. n., Peters, l. c. p. 574, Sarawak.
- Trachydosaurus*. The female produces a pair of young ones of considerable size about the end of January. Krefft, Austral. Vertebr. p. 44.
- Cyclodus* feeds, besides insects, on the berry called "jee-bung," and also on other berries and leaves. Krefft, l. c. p. 44.
- Egernia krefftii*, sp. n., Peters, MB. Ak. Berl. 1871, p. 30, Australia.
- Euprepes (Tiliqua) præornatus*, sp. n., Peters, l. c. p. 570, Sarawak.
- Euprepes (Tiliqua) percarinatus*, sp. n., Peters, l. c. p. 571, Eastern Java. [The Recorder regards the var. *borneensis*, p. 572, from Sarawak, as identical with *Euprepes rufescens*.]
- Euprepes macularius* described by Anderson, P. Z. S. 1871, p. 157.
- Euprepes novem-carinatus* from Upper Burmah, and *Euprepes longicaudatus* from Cachar, are described as new species by Anderson, J. A. S. B. 1871, pp. 12, 13.
- Euprepes isselii*, sp. n., Peters, MB. Ak. Berl. 1871, p. 567, Bogosland.

Sepidæ.

GÜNTHER, A. List of the Lizards belonging to the family

Sepidæ, with notes on some of the species. P. Z. S. 1871, pp. 240-244.

The author refers the 16 species known to 4 genera, regarding *Heteromeles*, *Gongylus*, and *Seps* as divisions of the same genus. He states that modifications of a rudimentary organ, like the limbs in this family, cannot be used as generic characters, and that in these Lizards the little-developed state of their limbs cannot be accounted for by the restriction of their habitat. [To the *Sepidæ* enumerated in this paper ought to be added *Sphenocephalus tridactylus* (Blyth).]

Sphenops meridionalis is a new name proposed by Günther for *Anisoterna sphenopsiforme* (Dum.), which cannot be generically distinguished from *Sphenops*. L. c. p. 242.

Seps (*Gongylus*) *capensis* (Smith). Notes by Günther, l. c. p. 242.

Seps (*Gongylus*) *viridanus* (Gravenh.) described by Günther, l. c. p. 243.

Emydactylus [quære *Hemidactylus* ?] *bouvieri*, sp. n., Bocourt, Ann. Mus. vi. 1870, Bull. p. 17, St. Vincent, Cape-Verde Islands.

Hemidactylus kelaartii (Theobald) and *H. marmoratus* (Blanf.) are now considered to be varieties of *H. leschenaultii* (D. & B.) by Blanford, P. A. S. B. 1871, p. 173. The author directs attention to variation in the development of tubercles in this genus.

Hemidactylus bengaliensis is described as a new species by Anderson, J. A. S. B. 1871, p. 14.

Nycteridium himalayanum, sp. n., Anderson, l. c. p. 15, Darjeeling.

Pentadactylus dorsalis, sp. n., Peters, MB. Ak. Berl. 1871, p. 569, Sarawak.

Gecko smithii described by Anderson, P. Z. S. 1871, p. 159.

Phelsuma andamanense. Notes by Anderson, l. c. p. 160.

Nautilinus elegans (Gray) figured by Buller in T. N. Z. Inst. iii. pl. 2. fig. 1. The same author describes *Nautilinus sulphureus* as new, *ibid.* p. 8. [This is a variety of *Nautilinus elegans*.]

Eublepharis macularius described by Anderson, P. Z. S. 1871, p. 163.

Pristurus longipes, sp. n., Peters, MB. Ak. Berl. 1871, p. 566, Aden.

Gymnodactylus fasciolatus, *G. variegatus*, and *G. (Pentadactylus) khasiensis* described by Anderson, P. Z. S. 1871, pp. 161, 162.

Gymnodactylus incertus, sp. n., Peters, MB. Ak. Berl. 1871, p. 397, Pebas.

Gymnodactylus consobrinus, sp. n., Peters, l. c. p. 569, Sarawak.

Anolis. M. Bocourt describes the following new species (Ann. Mus. Bullet.):—*A. stigmus*, 1869, v. p. 43, Columbia; *A. brevirostris*, 1870, vi. p. 11, St. Domingo; *A. cynocephalus*, p. 13, Cayenne; *A. williamsii*, p. 16, Bahia; and redescribes *A. fuscoauratus* (D'Orb.)=*A. viridieneus* (Ptrs.), p. 14.

Doryphorus castor, sp. n., Cope, P. Am. Phil. Soc. 1870, p. 556, Pebas.

Tropidurus. Prof. Peters (MB. Ak. Berl. 1871, p. 644) directs attention to the uselessness of the dorsal crest as a distinctive character in this genus. He arranges the species in the following subgeneric groups:—

1. *Tropidurus* (Wied.).

2. *Microlophus* (D. & B.).

3. *Craniopeltis*, subg. n., p. 645, for *T. grayi* (Bell) and *Craniopeltis bivittata*, sp. n., p. 645, from Chatham Island, Galapagos.

4. *Læmopristus*, subg. n., for *Læmopristus occipitalis*, sp. n., p. 645, Peru.

Phrynosoma said to squirt a red liquid from the eye. Wallace, P. Z. S. 1871, p. 1.

Gonyocephalus doriae, sp. n., Peters, MB. Ak. Berl. 1871, p. 570, Sarawak.—The author remarks that the generic name *Lophyrus* is preoccupied, and that the *Lophyrus giganteus* of the Nomencl. Berol. is only a *Gonyocephalus chamæleontinus*.

Japahura microlepis (Jerdon) is the female, and *J. planidorsata* (Jerdon) the young of *Japahura variegata*, according to Anderson, P. Z. S. 1871, pp. 164–166.

Laudakia (Plocedermia) melanura (Blyth), = *L. tuberculata* (Theobald), described by Anderson, P. A. S. B. 1871, p. 189.

Uromastix. Dr. Anderson "quite agrees with the remarks which have fallen from Mr. Theobald regarding the systematic position which had been assigned to the genera *Uromastix*, *Liolepis*, and *Phrynocephalus* before he proposed to group them under one very natural family, the *Uromasticidae*." P. Z. S. 1871, p. 167.

Chamæleon. Mr. Darwin figures the heads of males and females of *C. bifurcus* and *C. owenii*. 'Descent of Man,' ii. pp. 35, 36.

OPHIDIA.

Typhlops. Dr. Stoliczka (J. A. S. B. 1871) considers the number of longitudinal rows of scales, and the relative length of the body, to be constant specific characters, p. 423; makes remarks on *T. horsfieldii*, p. 423, *T. bothriorhynchus*, p. 424, and *T. braminus*, p. 425; and describes as new species:—*T. porrectus*, p. 426, pl. 25. figs. 1–4, from Bengal and N.W. Provinces; *T. andamanensis*, p. 428, pl. 25. figs. 9–12, and *T. theobaldanus*, p. 429, pl. 25. figs. 5–8, India.

Typhlops bothriorhynchus from the Garo Hills. Anderson, P. Z. S. 1871, p. 168.

Typhlops flavoterminalis discovered by Mr. Edward Newton at the Bassin de Caudan, Mauritius. Günther, Trans. R. Soc. Maurit. 1870, iv. pp. 63, 139.

Enulijs, g. n., Cope, P. Am. Phil. Soc. 1870, p. 558. Palate and anterior portion of maxillaries edentulous; a long grooved tooth behind; anterior frontals present; two nasals, a loreal, no preocular. Scales smooth, in 17 rows; anal and subcaudals double. *Enulijs murinus*, sp. n., Cope, l. c. p. 559, Nicaragua.

Oligodon dorsalis is from Khasia, not Afghanistan. Anderson, P. Z. S. 1871, p. 168.

Simotes bicatenatus. Note by Stoliczka, l. c. p. 430.—By Anderson, P. Z. S. 1871, p. 170.

Simotes punctulatus. Note by Anderson, l. c. p. 169.

Simotes semifasciatus, sp. n., Anderson, J. A. S. B. 1871, p. 16, Naga Hills.

Ablabes rappii. Note by Anderson, P. Z. S. 1871, p. 171.

Ablabes collaris. On its distribution, Stoliczka, l. c. p. 430.—Notes by Anderson, P. Z. S. 1871, p. 171.

Ablabes fuscus. Note by Anderson, l. c.

Ablabes longicaudus, sp. n., Peters, MB. Ak. Berl. 1871, p. 574, Sarawak.

Temnorhynchus lineatus, sp. n., Peters, *l. c.* p. 568, S.E. Africa.

Coleber porphyraceus. Notes by Anderson, P. Z. S. 1871, p. 172.

Compsosoma radiatum and *hodgsonii*. On their distribution in the Himalayas, Stoliczka, *l. c.* p. 430.

Compsosoma reticulare (= *C. fasciolatus*, Blyth). Notes by Anderson, P. Z. S. 1871, p. 172.

Zamenis ladacensis, sp. n., Anderson, J. A. S. B. 1871, p. 16.

Zamenis fasciolatus. Notes by Stoliczka, *l. c.* p. 431.

Zamenis diadema. Notes by Anderson, P. Z. S. 1871, p. 174.

Gonyosoma margaritatum, sp. n., Peters, MB. Ak. Berl. 1871, p. 578, Sarawak.

Dromicus viperinus (Gthr.) = *D. brevirostris* (Ptrs.), Peters, *l. c.* p. 400.

Tropidonotus. Dr. Stoliczka makes some remarks on *T. himalayanus*, *T. junceus*, and *T. subminiatus*, J. A. S. B. 1871, p. 434; and Dr. Anderson on *T. platyceps*, *T. macrophthalmus*, *T. subminiatus*, and *T. himalayanus*, P. Z. S. 1871, pp. 176-178.

Tropidonotus quincunciatus. A variety described by Stoliczka, *l. c.* p. 431, pl. 26. fig. 1.

Tropidonotus sikkimensis is described as a new species by Anderson, J. A. S. B. 1871, p. 17; is probably = *T. macrops*, Stoliczka, *ibid.* p. 436.

Tropidonotus macrophthalmus (Gthr.) = *T. macrops* (Blyth, imperfect description), ? = *T. sikkimensis* (Anderson), according to Stoliczka, *l. c.* p. 436.

Tropidonotus bellulus, sp. n., Stoliczka, P. A. S. B. 1871, p. 191, and J. A. S. B. 1871, p. 432, pl. 26. fig. 2, Pegu.

Tropidonotus maculatus, sp. n., Peters, MB. Ak. Berl. 1871, p. 575, Sarawak. [The name being preoccupied by Edeling in 1864 for another Bornean species, the Recorder has changed it to *sarawacensis*, P. Z. S. 1872.]

Pythonopsis borneensis described as a new species by Peters, in MB. Ak. Berl. 1871, p. 576 [is identical with *Phytolopsis punctata*, Gray].

Homalophis, subg. n., Peters, MB. Ak. Berl. 1871, p. 577. Two præfrontals, two or three supraorbitals; eyes surrounded with a ring of scales. Anterior labials very high, posterior divided. Posterior maxillary tooth long and grooved. Scales smooth; anal and subcaudals double.—*Homalophis dorice*, sp. n., Peters, *l. c.*, Sarawak. Scales in 31 rows.

Cantoria dayana (Stoliczka) described by Anderson, P. Z. S. 1871, p. 178.

Cerberus rhynchops. Note by Anderson, *l. c.* p. 179.

Ferania sieboldii (= *Feranoides jamnætica*, Carlleyle). Note by Anderson, *l. c.* p. 180.

Hipistes hydrinus. Note by Anderson, *l. c.* p. 181.

Psammophis condanarus. Note by Anderson, *l. c.* p. 182.

Psammodynastes pulverulentus. Note by Anderson, *l. c.* p. 183.

Dendrophis picta, var. *andamanensis*, Anderson, *l. c.* p. 184.

Dipsas hexagonata and *D. multifasciata* are the same species, according to Anderson, *l. c.* p. 186; which is [justly] contradicted by Stoliczka, J. A. S. B. 1871, p. 439.

Dipsas forsteni and *bubalina*. Notes by Stoliczka, J. A. S. B. 1871, pp. 439, 441; and by Anderson, P. Z. S. 1871, p. 187.

Pareas monticola. Note by Anderson, P. Z. S. 1871, p. 188.

Oxyrhopus submarginatus, sp. n., Peters, MB. Ak. Berl. 1871, p. 401, Peruvian Amazons.

Lycodon striatus. Note by Anderson, P. Z. S. 1871, p. 187.

Leptorhiza not distinct from *Lycodon*. Stoliczka, J. A. S. B. 1871, p. 442.

Homalochilus chrysogaster is described as a new species from Turk's Island by Cope, P. Am. Phil. Soc. 1870, p. 558. He also states that *Epicrates versicolor* (Steindachner) = *Homalochilus strigilatus* (Cope).

Python mohurus. Note on an example 30 feet long, said to have swallowed a young bison-cow by Sir W. Elliot, Rep. Brit. Assoc. 1871, Trans. p. 115.

Ophiophagus elaps. On its distribution, Anderson, P. Z. S. 1871, p. 188.

Callophis. Prof. Peters separates the species with long poison-glands into a distinct genus, *Adeniophis*. MB. Ak. Berl. 1871, p. 578.

Elaps annellatus, sp. n., Peters, l. c. p. 402, Highlands of Peru.

Platurus fischeri. Note by Anderson, P. Z. S. 1871, p. 189.

Hydrophis tuberculata, *fayreriana*, and *crassicolis* are described as new species from the Bay of Bengal by Anderson, J. A. S. B. 1871, pp. 18, 19.—*Hydrophis granosa* is another new species established by Dr. Anderson, P. Z. S. 1871, p. 190, from the Sand-heads.

Dr. Anderson makes also descriptive remarks on *H. jerdonii*, *chloris*, *lindsayi*, *coronata*, and *cantoris*. P. Z. S. 1871, pp. 190–192.

Trimeresurus. Notes on *T. gramineus*, *monticola*, and *convictus*, by Anderson, P. Z. S. 1871, pp. 194–196.

Trimeresurus andersoni (Theob.) is quite distinct from *T. monticola*, with which it is identified by Anderson in P. Z. S. 1871, p. 194, and allied to *T. porphyraceus* (Blyth). Stoliczka, J. A. S. B. 1871, p. 443.

Hypnale affinis is described as a new species from Ceylon by Anderson, J. A. S. B. 1871, p. 20.

Trigonocephalus lanceolatus. Sclater recommends the introduction of the Mongoose for its destruction. P. Z. S. 1871, p. 2.—R. Brown would recommend Pigs, which are very useful in destroying Rattlesnakes. *Ibid.* p. 39.

Crotalus. The sound of the rattle resembles the singing of a cricket; and its use seems to be to decoy insectivorous animals [?]. Wallace, P. Z. S. 1871, p. 2.

Vipera nasicornis. On the habits, Ussher, P. Z. S. 1871, p. 638.

Echis carinata produces a hissing sound by rubbing the scales against each other. Anderson, P. Z. S. 1871, p. 196.

BATRACHIA SALIENTIA.

J. SAHLERTZ has published "Some contributions to the Biology of the Danish species of Frogs and Toads," in which he shows that his observations on the time of hibernation and propagation of the various species really confirm the distinctness of the species recognized by Steenstrup. Vidensk. Medd. naturh. Foren. Kjöbenh. 1871, pp. 109–134.

BELLO Y ESPINOSA states that there is a frog (*Hylodes*?) in Porto Rico, called *co-qui* by the inhabitants, the young of which do not pass through a metamorphosis, but are provided with four

legs and air-breathers when hatched. In a few days they attain to the full size [?]. Zool. Gart. 1871, p. 351.

Rana. "On the structure and development of the skull of the Common Frog (*Rana temporaria*)," by W. K. Parker, Phil. Trans. vol. clxi. 1871, pp. 137-211, pls. 3-10.

Rana. Dr. Anderson has made descriptive remarks on *R. kuhlii*, *fuscata*, *liebigii* (= *Megalophrys gigas*, Blyth), *crassa*, and *gracilis*. P. Z. S. 1871, pp. 197-200.

Rana gammii, sp. n., Anderson, J. A. S. B. 1871, p. 21, Darjeeling.

Rana esculenta. Kolazy reports that he succeeded in retarding the development of the Tadpole by insufficient nourishment. They remained in the larval condition during the winter—fifteen months altogether. Verh. z.-b. Ges. Wien, 1871, pp. 38, 1267.

Rana temporaria. A. de la Fontaine controverts Steenstrup's views regarding the existence of two distinct species. Publicat. de l'Institut. de Luxembourg, xi. p. 49.

Rana affinis. Notes by Peters, MB. Ak. Berl. 1871, p. 402.

Rana brevipalmata is described as a new species by Peters, l. c. p. 646, Pegu.

Rana macronotus. See *Ixalus aurifasciatus*.

Pyxicephalus khasianus, sp. n., Anderson, J. A. S. B. 1871, p. 23.

Pyxicephalus fodiens (Jerdon) = *P. breviceps* (Schn.). Anderson, P. Z. S. 1871, p. 200.

Cystignathus tæniatus obtained in Chiloe by Cunningham, Trans. Linn. Soc. xxvii. p. 467.

Chiroleptes brevipes, sp. n., Peters, MB. Ak. Berl. 1871, p. 648, N.E. Australia.

Megalophrys montana. Heads of male and female figured by Darwin, 'Descent of Man,' ii. p. 27.

Xenophrys monticola = *X. gigas* (Jerdon, 1870), Anderson, P. Z. S. 1871, p. 200.

Pelobates cultripes. Fatio describes the way in which this frog buries itself in the ground. Verh. schweiz. ntrf. Gesellsch. 1869, p. 59.

Rhinoderma darwini obtained in the island of Quehuu, near Chiloe, by Cunningham, Trans. Linn. Soc. xxvii. p. 468.

Cacopus globulosus. Note by Anderson, P. Z. S. 1871, p. 201.

Diploelma. Dr. Anderson has published descriptions of *D. berdmorei* (Blyth) and *D. interlineatum* (Blyth), P. Z. S. 1871, p. 202. [The latter has been identified by the Recorder as *Calophrynus pleurostigma*.]

Calophrynus punctatus, sp. n., Peters, MB. Ak. Berl. 1871, p. 579, Sarawak.

Bufo pantherinus from the Agra district, described by Anderson, P. Z. S. 1871, p. 203.

Bufo. *Bombinator sikkimensis* (Blyth) is referred to this genus by Anderson, l. c. p. 204.

Bufo sumatranus, sp. n., Peters, MB. Ak. Berl. 1871, p. 648, interior of Sumatra.—*Bufo divergens*, sp. n., Peters, l. c. p. 579, Sarawak.

Hylorana. Dr. Anderson (P. Z. S. 1871) describes *Limnodytes nigrovittatus* (Blyth), p. 205, and *Hylorana nicobariensis* (Stoliczka), p. 206.

Hylorana granulosa, sp. n., Anderson, J. A. S. B. 1871, p. 23, Yunan.—*Hylorana monticola*, sp. n., Anderson, *ibid.* p. 25, Darjeeling.

Limnodytes luctuosus, sp. n., Peters, MB. Ak. Berl. 1871, p. 579, Sarawak.

Ixalus aurifasciatus of Peters, 1863, proves to be a young *Rana macrodon*. Peters, *l. c.* p. 650.

Ixalus pictus, sp. n., Peters, *l. c.* p. 580, Sarawak.

Ixalus punctatus, sp. n., Anderson, J. A. S. B. 1871, p. 27, Nilgherries.—

Ixalus lateralis, sp. n., Anderson, *ibid.* p. 29, hab. — ?

Polypedates. Dr. Anderson (P. Z. S. 1871) describes:—*P. smaragdinus* (Blyth), p. 208; *P. marmoratus* (Blyth) = *P. afghana* (Gthr.), p. 209; *P. hascheanus* (Stoliczka), p. 209; and *P. annectens* (Jerdon), p. 210.

Polypedates tuberculatus, sp. n., Anderson, J. A. S. B. 1871, p. 26, Assam.

Polypedates biscutiger, sp. n., Peters, MB. Ak. Berl. 1871, p. 649, Ceylon.—
Polypedates raniceps, sp. n., Peters, *l. c.* p. 580, Borneo.

Polypedates mackloti (Schleg.), from Java, described by Peters, *l. c.* p. 650.

Rhacophorus maculatus, sp. n., Anderson, J. A. S. B. 1871, p. 27, Khasi Hills.

Rhacophorus maximus is from Khasia, not Afghanistan. Anderson, P. Z. S. 1871, p. 210.

Hylodes leptopus obtained at Puerto Bueno, west coast of Patagonia, by Cunningham, Trans. Linn. Soc. xxvii. p. 468.

Hyla. Prof. Cope changes the name of his genus *Cinclidium* into *Cinloscopus*, P. Am. Phil. Soc. 1870, p. 554. He describes as new species *Hypsi-boas hypselops* from Pebas, *ibid.*, and *H. lanciformis*, from the same locality, p. 556; and makes remarks on *H. indris* and *H. circumdatus*, p. 555.

Hyla. Prof. Peters makes some remarks on *H. punctata* (Schn.) = *H. rhodoporus* (Gthr.), *H. marmorata* (Laur.), *H. conirostris* (Ptrs.), and *H. aurantiaca* (Daud.). MB. Ak. Berl. 1871, pp. 403, 404. On *Hyla microtis* (Ptrs.) = *H. miotympanum* (Cope), *ibid.* p. 651.

Hyla granulata, sp. n., Peters, *l. c.* p. 651, Porto Alegre.

Hyla agrestis. Coloration during life noticed by Cunningham, Trans. Linn. Soc. xxvii. p. 468.

Phyllomedusa hypochondrialis. Prof. Peters adopts the view that this is a species distinct from *Ph. bicolor*. MB. Ak. Berl. 1871, p. 404.

Hylaplesia tinctoria. Dr. André Posada, Arango, in a pamphlet entitled 'Mémoire sur le Poison de Rainette des sauvages du Chocó, présenté à la Société allemande de Paris' (Paris, 1869, 8vo, pp. 16, with a plate), describes a frog from which the savage tribes of New Granada extract a deadly poison for their arrows. The process of extracting it, and its physiological effects, are described. The author names this frog *Phyllobates chocoensis*; but it is evidently the well-known *Hylaplesia tinctoria*.

BATRACHIA GRADIENTIA.

Tylototriton, g. n., Anderson, P. Z. S. 1871, p. 423. Head surrounded by a prominent osseous ridge, with a short longitudinal ridge along the vertex. The bony orbit above the eye similar to that of *Cynops* &c. Parotoids large. Along the body a lateral line of large knob-like tubercles. Tail compressed. Fingers four, toes five. Palatine teeth begin on a line with the internal nostrils, in two ridges, meeting in front, but widely divergent behind. Tongue suborbicular, adherent, and slightly free at the edge.—

Tylototriton verrucosus, sp. n., Anderson, l. c., with woodcut, from Western Yunan.

Salamandra maculosa is able to utter a sound (*U-ik*). Hoefer, Mitth. ntrw. Verein. in Neu-Vorpommern und Rügen, i. p. 64.

Amblystoma luridum. On its development, P. R. Hoy, Amer. Nat. 1871, v. pp. 578, 579, with woodcuts.

Sieboldia davidiana described as a new species from Western China by Blanchard, Compt. Rend. 1871, lxxiii. p. 79, or A. & M. N. H. 1871, viii. p. 212. [No distinctive characters are pointed out.]

Cryptobranchus japonicus. The muscles and nerves described by Humphry, J. Anat. & Physiol. 1871, pp. 1-61, pls. 1-4.

PISCES

BY

ALBERT GÜNTHER, M.A., M.D., PH.D., F.R.S.

General Works.

BLEEKER, P. Atlas Ichthyologique des Indes Orientales Néerlandaises. See Zool. Rec. i. p. 134, ii. p. 163, vi. p. 123, vii. p. 82.

In the year 1871, livr. 24 only has been issued, containing the text to the *Scombresocidæ*, and plates representing part of the *Pleuronectidæ* and *Clupeidæ*.

DARWIN, C. The Descent of Man, and Selection in relation to Sex. London: 1871. 16mo, vol. i. pp. 423, vol. ii. pp. 475, with numerous woodcuts.

Part of chapter xii. (pp. 1-24) contains an account of the best-authenticated cases of sexual differentiation in fishes, some of which will be referred to in the special part of this Record. [Cf. *suprà*, pp. 1, 2, 25-27, 77.]

Anatomical and Physiological Publications.

BERT, P. Sur les phénomènes et les causes de la mort des animaux d'eau douce que l'on plonge dans l'eau de mer. Compt. Rend. 1871, lxxiii. pp. 382, 464.

GEGENBAUR, C. Ueber die Kopfnerven von *Hexanchus* und ihr Verhältniss zur Wirbeltheorie des Schädels. Jena. Z. f. Med. u. Ntrw. 1871, pp. 497-560, Taf. 13. [On the cerebral nerves of *Hexanchus*, with reference to the cerebral theory of the skull.]

JOURDAIN, S. Matériaux pour servir à l'histoire anatomique du Poisson lune (*Orthogoriscus mola*). Compt. Rend. 1871, lxxiii. pp. 1225-1229.

Chiefly on the portal venous system of the kidneys.

MACDONALD, —. On the homologies of the vertebral skeleton 1871. [VOL. VIII.]

- in Osseous Fishes and in Man. P. R. Soc. Edinb. 1871, pp. 472-474.
- MIVART, ST. G. On the Vertebrate Skeleton. Trans. Linn. Soc. 1871, xxvii. pp. 369-392, pl. 53. [See p. 4.]
- PANCERI, P. Intorno alla luce emanata dal grasso. Rendic. Acc. Napol. 1871, April.
- POUCHET, G. Sur des Cyprins monstrueux (*C. auratus*) venant de Chine. Robin's Journ. Anat. 1870-71, pp. 561-569, pl. 17.
- SCHULZE, F. E. Ueber die Sinnesorgane der Seitenlinie bei Fischen und Amphibien. Arch. mikrosk. Anat. vi. p. 62, pls. 4-6. [On the organs of sense in the lateral line in Fishes and Amphibians.] Abstract in Arch. Zool. Expér. et Génér. i. 1872, pp. i-iv.

GENERAL NOTES AND FAUNÆ.

M. PANCERI presented to the recent congress of naturalists and physicians at Turin the result of some investigations as to the cause of phosphorescence in animals, and especially in fishes. He has come to the conclusion that the cause of this phenomenon is the slow oxidation of fat, which he finds to be always present when the phosphorescence is observed in animal substances. In the case of fish the oxygen of the air very readily penetrates the skin, and acts upon the subcutaneous adipose tissue. The phenomenon is promoted by placing the phosphorescent substance in oxygen, but is entirely arrested by its immersion in carbonic acid, fresh water, alcohol, or any solution not containing oxygen. Phosphorescence usually commences immediately after death, and continues until decomposition sets in with disengagement of ammonia, when it invariably ceases. Rendic. Acc. Napol. 1871, April.

Scandinavia. Herr MALM has added three species to the fauna of Scandinavia, viz. *Trigla pini*, *Pelamys sarda*, and *Gobius microps*, which he describes, Cfv. Sv. Akad. 1870, pp. 825-852.

Ireland. Mr. W. ANDREWS has reported on his recent observations of fishes on the Irish coast. He has noticed, among others, *Engraulis encrasicolus*, *Trichiurus lepturus*, *Centrolophus pompilus*. P. Dubl. Soc. vi. pp. 32-35, 68-71.

Pomerania. 'Die Wirbelthiere Pommerns,' by T. HOLLAND. Stolp: 1871. 8vo, pp. 119. The author enumerates 92 fishes. A work of local interest.

Adriatic. Professor SCHMARDA has published a series of articles in the 'Österreichischen Revue' on the "Maritime Production der österreichischen Küstenländer." In the first

article (1864, vi. pp. 69-105) the author makes historical and introductory remarks on the efforts made by Austria in developing the resources of power and wealth offered by her situation on the Adriatic. He shows that, compared with other nations, Austria is far behind with regard to the income derived from marine productions. Yet, of the 440 kinds of fishes known to inhabit the Adriatic, about 100 are valuable food-fishes, although only 40 are esteemed for the table. He then enters into a consideration of the measures which ought to be adopted for an improvement of the fisheries. In the second article (1865, i. pp. 108-141) the physical features of the Venetian coast, and the instruments used by the Venetian fishermen, are described. The fisheries of the various towns of this district have gradually declined. The third article (1865, iii. pp. 66-99) treats of the fisheries of the coast of Görz; and the fourth (1866, pp. 50-117) of those of Istria. A detailed account is given of the fisheries of Sardines, Anchovies, Mackarels, Tunnies, &c., and of their preparation for the trade. The author calculates the whole produce of Istrian fisheries at 52,000 hundredweights, of which 24,000 are salted, requiring 6000 hundredweights of salt. The fifth and sixth articles (1867, ix. pp. 45-89) contain reports on the fisheries of the Croatian and Dalmatian coasts.

Algeria. Messrs. PLAYFAIR and LETOURNEUX have published a "Memoir on the Hydrographical System and the Freshwater Fish of Algeria" in A. & M. N. H. 1871, viii. pp. 373-394, in which they give a highly instructive account of the hydrographical features of the various parts of Algeria, peculiar in this respect, that a portion of the waters return to the clouds without passing through the sea, or circulate in vast subterranean lakes. The authors describe or notice 21 freshwater species, of which 16 are found in the Tell, 7 on the High Plateaux, and 4 in the Sahara. Five are peculiar to Algeria. Very singular is the presence in fresh water of several marine forms.

United States. "A partial synopsis of the Fishes of the Fresh Waters of North Carolina," by E. D. COPE. P. Am. Phil. Soc. 1870, pp. 448-495. The author describes or mentions 81 species, besides others from various parts of the United States. He characterizes the river-systems of North Carolina, and tabulates the species found in each.—"On some Etheostomine Perch from Tennessee and North Carolina," by E. D. COPE, P. Am. Phil. Soc. 1870, pp. 261-270.—The notes on freshwater fishes of New Jersey by C. C. ABBOTT (see Zool. Record, vii. p. 83) have been continued in Amer. Nat. 1871, iv. pp. 717-720.—"On the Food and Habits of some of our Marine Fishes," by A. E. VERRILL. Amer. Nat. 1871, v. pp. 397-400.

West Indies. Prof. COPE has reported on some collections made at St. Martin's, St. Croix, and St. Christopher's. He enumerates the species contained in these collections, and describes

those which he regards as new, 23 in number. Tr. Am. Phil. Soc. xiv. pp. 461-483, with 8 woodcuts.

Upper Amazons. Prof. COPE has reported on a collection from Pebas. Twenty-two species are described as new. P. Am. Phil. Soc. 1870, pp. 559-570.

Patagonia. 'Notes on the Natural History of the Strait of Magellan and West Coast of Patagonia, made during the Voyage of H.M.S. 'Nassau,' in the years 1866-69,' by R. O. CUNNINGHAM (Edinb. 1871, 8vo, pp. 517), contain numerous observations on the occurrence of fishes collected by the author on the shores of the southernmost parts of South America.—These observations are collected in a separate paper, "Notes on the Reptiles, Amphibia, Fishes, &c. obtained during the Voyage of H.M.S. 'Nassau,'" in Trans. Linn. Soc. xxvii. 1871, pp. 465-473.

Africa. M. DE BRITO CAPELLO has commenced a list of the species from Madeira, the Azores, and Portuguese possessions in Africa, which are contained in the Lisbon Museum. Jorn. Sc. Lisb. 1871, pp. 194-202, 280-282.

Red Sea. Dr. KLUNZINGER has published the second part of his "Synopsis der Fische des Rothen Meers" [see Zool. Record, vii. p. 84] in Verh. z.-b. Ges. Wien, 1871, pp. 441-688.—A systematic index of all the fishes of the Red Sea is added, *ibid.* pp. 1353-1368.

India. Mr. F. DAY has published the following papers:— "Monograph of Indian Cyprinidæ," J.A.S.B. 1871, pp. 95-142, 277-367, with 4 plates. "On Hamilton Buchanan's original Drawings of Fish in the Library of the Asiatic Society of Bengal," P. A. S. B. 1871, pp. 195-209. "On the Freshwater Siluroids of India and Burmah," P. Z. S. 1871, pp. 703-721.—"Report on the Fish and Fisheries of the Fresh Waters of India," Simla, 1871, 8vo, pp. 49. The subject is divided under the five following heads:—1. Does a wasteful destruction of freshwater fish exist at present in India and Burmah? 2. The fishermen of India and Burmah. 3. The fisheries and how they are worked. 4. The fish that are eaten. 5. Fish in an economic point of view, including remarks on the effects of a fish diet.

Celebes. Dr. GÜNTHER has described 13 new species from collections made by Dr. A. B. Meyer at Menado. P. Z. S. 1871, pp. 652 *et seqq.*

Polynesia. Dr. GÜNTHER has described 16 new species from collections received from the Godeffroy Museum. P. Z. S. 1871, pp. 652 *et seqq.*

Australia and New Zealand. Mr. KREFFT has published a pamphlet, 'Australian Vertebrata, Fossil and Recent' (8vo, pp. 96: place and date of publication?), containing a nominal list of 439 fishes of the coasts and fresh waters of Australia and New Zealand.—Dr. GÜNTHER has described 10 new species from

this region. He draws attention to the surprising fact that a number of common European marine fishes, which hitherto have never been met with between the tropics, reappear in temperate seas of the southern hemisphere. P. Z. S. 1871, pp. 653 *et seqq.*

Prof. E. D. COPE has read a paper before the American Association for the Advancement of Science, published in Amer. Natur. 1871, v. pp. 579-593, and in Tr. Am. Phil. Soc. xiv. pp. 445-461, and entitled "Observations on the systematic relations of the Fishes." The author having purchased Prof. Hyrtl's collection of 800 skeletons of fishes, and made it the base of his researches into the osteological characteristics of the class, has recognized the necessity of breaking up Müller's subclass of Ganoids, and of introducing several other radical changes into the system, as will be seen from the following arrangement proposed by him:—

- I. Subclass HOLOCEPHALI.
- II. " SELACHII.
- III. " DIPNOI.
- IV. " CROSSOPTERYGIA.
- V. " ACTINOPTERI.
- A. Tribe CHONDROSTEI.
- 1. Order *Selachostomi* (Spatularia).
- 2. " *Glaniosomi* (Sturgeon).
- B. Tribe PHYSOSTOMI.
- * A præcoracoid arch.
- † A coronoid bone.
- 3. Order *Ginglymodi* (the bony Gar).
- 4. " *Halecomorphi* (Amiidae).
- †† No coronoid bone.
- 0. No symplectic bone.
- 5. Order *Nematognathi* (Catfishes, descendants of the Sturgeons;
3 families: Siluridae, Aspredinidae, Hypophthalmidae).
- 6. Order *Scyphophori* (Mormyri and *Gymnarchus*).
- 00. Symplectic present.
- 7. Order *Plectospondyli* (Catostomidae, Cyprinidae + Cobitidae, Sternopygidae, Characinidae + Erythrinidae).
- 8. Order *Isospondyli* (Notopteridae, Hyodontidae + Albulidae + Elopidae, Aulopidae + Coregonidae + Lutodiridae, Sauridae + Goniorhynchidae, Alepocephalidae + Salmonidae, Chirocentridae + Clupeidae, Osteoglossidae, Heterotidae + Galaxiidae).
- ** No præcoracoid arch.
- † Scapular arch suspended to cranium.
- 0. A symplectic.
- 9. Order *Haplomi* (Esocidae, Umbridae, Cyprinodontidae + Hypsæidae).
- 10. " *Glanencheli* (Electric Eel).
- 00. No symplectic.
- 11. Order *Ichthyoccephali* (Java Eels).

- †† Scapular arch free behind the cranium.
 O. Præoperculum.
12. Order *Holostomi* (Symbranchi).
 13. „ *Enchelycephali* (Congridæ, Anguillidæ, Gymnothoracidæ).
 OO. Præoperculum wanting or rudimental.
14. Order *Colocephali* (Murænæ).
 C. Tribe PHYSOCLYSTI.
- * Scapular arch not suspended from the cranium.
15. Order *Opisthomi* (Mastacembelidæ).
 ** Scapular arch suspended from the cranium.
 † Ventral fins abdominal.
16. Order *Percesoces* (Ophiocephalidæ, Mugilidæ, Atherinidæ).
 17. „ *Syngnathii* (Scombresocidæ).
 18. „ *Hemibranchii* (Gasterosteidæ, Fistulariidæ, Centriscidæ, Amphisitidæ).
 19. „ *Lophobranchii*.
 †† Ventral fins thoracic or jugular.
20. Order *Pediculati* (Antennariidæ, Lophiidæ).
 21. „ *Heterosomata* (Flounders).
 22. „ *Plectognathi*.
 23. „ *Percomorphi* (Perch).
 a. *Anacanthini* (Gadidæ and Macruridæ).
 b. *Haplodoci* (Batrachidæ).
 c. *Scyphobranchii* (Uranoscopidæ, Gobiidæ, Blenniidæ, Gobioidæ, Cottidæ).
 d. *Epelasmia* (Acronuridæ, Chaetodontidæ).
 e. *Rhynopterii* (Polynemidæ).
 f. *Distegi* (Scombridæ, Xiphiadidæ, Trichiuridæ, Berycidæ, Percidæ, Sparidæ, Sciaenidæ, Pristipomatidæ, Triglidæ, Sillaginidæ, Carangidæ, Echeneidæ, Gerreidæ, Heterognathidæ).
 g. *Labyrinthici*.
24. Order *Pharyngognathi* (Embiotocidæ, Chromididæ, Labridæ, Scaridæ).

PALÆICHTHYES.

GANOIDEI.

✓ Dr. LÜTKEN's paper on the classification and limits of Ganoids [see Zool. Rec. vi. pp. 125, 138] has been published in a translation in Ann. & Mag. N. H. 1871, vii. pp. 329-339.

✓ *Ceratodus*. Dr. Günther's researches into the structure of this fish are contained in the following papers:—

✓ 1. Description of *Ceratodus*, a genus of Ganoid fishes recently discovered in Queensland, Australia. Proc. Roy. Soc. 1871, March 16, pp. 377-379 (Abstract of the Memoir No. 4).

✓ 2. *Ceratodus* and its place in the system. A. & M. Nat. Hist. 1871, vii. pp. 222-227, with two woodcuts (paddle of *Ceratodus* and *Acipenser*).

✓ 3. The new Ganoid Fish (*Ceratodus*) recently discovered in Queensland,

'Nature,' 1871, September and October, nos. 99, 100, 102. In this paper the author enters more especially into the reasons which induced him to unite Ganoids and Plagiostomes in one subclass, and adds some important details and corrections regarding the generative organs. From these three papers an account has been compiled by Prof. Troschel in Wieg. Arch. 1871, pp. 325-344*.

4. The complete memoir in Philos. Trans. ii. 1872, pp. 511-571, pls. 30-42. The separate reprints were issued in 1871 (November).

Acipenser. Dr. Knoch has made the important observation that young Sterlets (and probably all young Sturgeons) are provided with small deciduous teeth. Bull. Mosc. 1871, no. 1, p. 281, Taf. 6. fig. 7.

Acipenser sterletus. Dr. Knoch reports on a journey made to the Volga for the purpose of obtaining spawn of the Sterlet, and of attempting its acclimatization in other parts of Europe, adding some remarks on the early stages of its development. L. c. 1871, no. 1, pp. 254-289, Taf. 6.—On the same subject, A. Murray, P. Z. S. 1871, pp. 11-13.

Acipenser sturio. Its occurrence in the Rhine and Maine, by Noll, Zool. Gart. 1871, pp. 180-183.

HOLOCEPHALA.

Callorhynchus antarcticus. Egg figured by R. O. Cunningham, in 'Notes on the Natural History of the Strait of Magellan,' on a plate, p. 340.

PLAGIOSTOMATA.

Carcharias. Dr. Klunzinger (Verh. z.-b. Ges. Wien, 1871, pp. 655-662) describes six species from the Red Sea, one being new, *Carcharias ehrenbergii* (p. 661).

Lorodon macrorhinus occurs in the Red Sea. Klunzinger, l. c. p. 662.

Galeocerdo obtusus, sp. n., Klunzinger, l. c. p. 664, Red Sea.

Dirrhizodon elongatus, g. et sp. n., Klunzinger, l. c. p. 664, Red Sea : near *Thalassorhinus*.

Mustelus vulgaris and *lævis* from the Red Sea. Klunzinger, l. c. p. 668.

Lamna spallanzanii occurs in the Red Sea. Klunzinger, l. c. p. 669.

Chiloscyllium modestum, sp. n., Günther, P. Z. S. 1871, p. 654, pl. 54, Queensland.

Acanthias vulgaris taken in Falkland Sound and in the Strait of Magellan by Cunningham, Trans. Linn. Soc. xxvii. p. 473.

Torpedo. "Détermination de la durée de la décharge électrique chez la torpille," by Marey, Compt. Rend. 1871, lxxiii. pp. 958-961.

Torpedo sinuspersici described by Klunzinger, Verh. z.-b. Ges. Wien, 1871, p. 677.

Raja. On sexual differences, Darwin, Descent of Man, ii. pp. 2, 6.

Urogymnus rhombeus, sp. n., Klunzinger, l. c. p. 683, Red Sea.

* The Recorder must express his thanks to Prof. Troschel for the care he has bestowed on the translation of these articles. In one or two cases only, later corrections stand now side by side with the first account, which renders these passages somewhat obscure.

- Trygon liocephalus*, sp. n., Klunzinger, l. c. p. 678, Red Sea.
Urolophus chilensis, sp. n., Günther, P. Z. S. 1871, p. 653, pl. 53.
Dicerobatis monstrum, sp. n., Klunzinger, l. c. p. 687, Red Sea.

TELEOSTEI.

ACANTHOPTERYGII.

PERCIDÆ.

- ✓ F. POEY. Genres des Poissons de la Faune de Cuba, appartenant à la famille *Percidæ*. Ann. Lyc. New York, x. 1871, pp. 27-79.

In this paper the author endeavours to define and characterize genera introduced by Mr. Gill into literature.

- ✓ *Ctenolates*, g. n., Günther, P. Z. S. 1871, p. 320. B. 7; pseudobranchiæ; teeth villiform, in bands; teeth on the palatines and vomer; tongue smooth. The spinous dorsal is continuous with the soft, composed of ten spines. Præoperculum finely serrated behind, and with small denticulations on the lower limb; præorbital serrated. Scales small, strongly ctenoid.—*Ctenolates macquariensis* described as a new species, l. c. pl. 33 [identical with *Datnia ambigua*, Richardson]. ✓

Etheostoma nevisense described as a new species by Cope, P. Am. Phil. Soc. 1870, p. 261, North Carolina.

Pecilichthys vitreus, *sanguifluus*, *camurus*, *vulneratus*, and *ruflilineatus* are described as new species by Cope, l. c. pp. 263-267, from Tennessee and North Carolina.

- ✓ *Boleosoma effulgens* (Girard) and ✓ *B. maculaticeps* and ✓ *æsupus* are described by Cope, l. c. pp. 268-270, the latter as new.

- ✓ *Hypochomus* is a new generic name for *Cottogaster aurantiacus* proposed by Cope, l. c. p. 449.

Anthias rhodopeplus and *Anthias chrysostictus*, spp. nn., Günther, P. Z. S. 1871, pp. 654, 655, pls. 55 and 56, Manado.

- ✓ [*Serranus*] *Epinephelus chalinius*, sp. n., Cope, Tr. Am. Phil. Soc. xiv. p. 465, St. Martins.—*Epinephelus ordinatus*, sp. n., Cope, l. c. p. 466, Panama.
 ✓ —*Epinephelus brachysoma*, sp. n., Cope, l. c. p. 466, Rio Janeiro.

- ✓ *Serranus humeralis* (C. & V.) = *S. albomaculatus* (Jenyns), Günther, P. Z. S. 1871, p. 654.

- ✓ *Plectropoma crocata*, sp. n., Cope, Tr. Am. Phil. Soc. xiv. p. 466, St. Martins.

- ✓ [*Plectropoma*] *Hypoplectrus maculiferus*, sp. n., F. Poey, Ann. Lyc. New York, x. 1871, p. 78, pl. 1, Cuba.

Plectropoma anthioides, sp. n., Günther, P. Z. S. 1871, p. 655, Manado.

- ✓ [*Rhypticus*] *Eleutheractis coriaceus* is described by Cope as a new genus and species from St. Martins, Tr. Am. Phil. Soc. xiv. p. 467, fig. 3.

Mesoprion. Poey has discovered cases of hermaphroditism in *Mesoprion cynodon* and *chrysurus*. The male and female organs are intimately connected with each other, and can be easily distinguished by the difference in colour and granulation. Ann. Lyc. New York, ix. p. 309.

✓ *Mesoprion rosaceus* and *Ocyurus lutjanoides* are described as new Cuban species by Poey, *l. c.* pp. 317, 319.

[*Mesoprion*] *Lutjanus cubera* is described as a new Cuban species by F. Poey, *l. c.* x. 1871, p. 75.

✓ *Mesoprion*. Mr. Cope describes as new species (Tr. Am. Phil. Soc. xiv.) :—*Ocyurus rygersmæi*, St. Kitts, p. 468, fig. 4; *Lutjanus* (or *Ocyurus*) *torridus*, St. Kitts, p. 469, fig. 5; and *Lutjanus brachypterus*, Bahamas, p. 470.

Priacanthus meyeri, sp. n., Günther, P. Z. S. 1871, p. 656, Manado.

Ambassis miops, sp. n., Günther, *l. c.* p. 655, Cook's Islands.

✓ *Apogon savayensis*, sp. n., Günther, *l. c.* p. 656, Samoa Islands and Celebes.

✓ *Centrarchidæ* (Cope). Prof. Cope makes some observations on the systematic arrangement of the genera adopted by him, characterizes species of *Lepomis*, and describes as new *Lepomis purpurescens* [sic], from North Carolina, and *Lepomis peltastes*, from the Huron River. P. Am. Phil. Soc. 1870, pp. 451-454.

PRISTIPOMATIDÆ.

Pristipoma manadense, sp. n., Günther, P. Z. S. 1871, p. 657, Manado.

Histioporus labiosus, sp. n., Günther, *l. c.* p. 658, pl. 59, South Australia.

Diagramma obscurum, sp. n., Günther, *l. c.* p. 657, pl. 58, Feejee Islands.

SQUAMIPINNES.

✓ *Tholichthys* having proved to be the young of some Squamipinnate fish, Dr. GÜNTHER expresses it as his opinion that all the fishes of this family appear to have a *Tholichthys* stage. He describes and figures the young of *Chatodon citrinellus*, and a second *Tholichthys* form, reminding us of *Hemiochus*. A. & M. N. II. 1871, viii. pp. 318-320.

Chatodon miliaris from Celebes described by Günther, P. Z. S. 1871, p. 658.

SCORPÆNIDÆ.

Sebastes rhodochrous, sp. n., Günther, P. Z. S. 1871, p. 659, Manado.

✓ *Synanceia verrucosa*, named "Laffie" at the Mauritius, is a highly poisonous fish; the poison-organs are the dorsal spines, each being provided with a poison-bag at its base. Le Juge, Trans. R. Soc. Maurit. 1871, v. pp. 19-24.

✓ *Agriopus torvus*. Historical remarks by Günther, *l. c.* p. 659.

TEUTHIDIDÆ.

Dr. KLUNZINGER considers the separation of this family from the *Acronuridæ* to be justified. Verh. z.-b. Ges. Wien, 1871, p. 501.

He describes four known species from the Red Sea, *l. c.* pp. 502-504.

BERYCIDÆ.

✓ [*Beryx*] *Rhinoberyx chryseus*, sp. n., Cope, Tr. Am. Phil. Soc. xiv. p. 464, St. Croix.

✓ *Holocentrum sicciferum* is described as a new species from the Bahamas by Cope, *l. c.* p. 465.

✓ *Holocentrum microstoma* probably the same as *H. tahiticum*. Günther, P. Z. S. 1871, p. 660.

Holocentrum diploxiphus, sp. n., Günther, *l. c.* pl. 60, Samoa Islands.

- ✓ *Rhynchichthys* is probably the young of *Holocentrum*. Günther, A. & M. N. H. 1871, viii. p. 320.

KURTIDÆ.

- ✓ *Pempheris mangula* = *P. otaitensis*, according to Klunzinger, Verh. z.-b. Ges. Wien, 1871, p. 469.
 ✓ *Pempherichthys*, g. n., Klunzinger, l. c. p. 470, distinguished from *Pempheris* by a naked anal fin and ctenoid scales.
Pempherichthys güntneri, sp. n., Klunzinger, l. c., Red Sea.

XIPHIIDÆ.

- GRAY, J. E. On the injury inflicted on ships by the Broad-finned Sword-fish of the Indian Ocean. A. & M. N. H. 1871, viii. pp. 338, 339.

ACRONURIDÆ.

Acanthurus. Dr. Klunzinger describes eight known species from the Red Sea, Verh. z.-b. Ges. Wien, 1871, pp. 504-510.

✓ *Acronurus* and *Keris* are probably the young of *Acanthurus* or *Naseus*. Günther, A. & M. N. H. 1871, viii. p. 320.

Acanthurus aterrimus, sp. n., Günther, P. Z. S. 1871, p. 660, Samoa Islands.

Acronurus lineolatus is mentioned as a new species from the Red Sea by Klunzinger, l. c. p. 511.

Naseus vomer, sp. n., Klunzinger, l. c. p. 514, Red Sea.

CARANGIDÆ.

- ✓ *Cyranx*. Dr. Klunzinger (Verh. z.-b. Ges. Wien, 1871,* pp. 453-466) distinguishes 21 species from the Red Sea, the greater part of which are described. The author differs in many points of synonymy from his predecessors, and describes as *new species* the following:—*C. rhabdolepis*, p. 457, *C. elongatus*, p. 458, *C. brevicarinatus* and *C. bleekeri*, p. 461.

Chorinemus. On the Red-Sea species see Klunzinger, l. c. pp. 447, 448.

- ✓ *Seriola aureovittata* (Schleg.) described by Klunzinger, l. c. p. 450.

NOMEIDÆ.

Cubiceps multiradiatus, sp. n., Günther, P. Z. S. 1871, p. 661, pl. 61, Manado.

CYTTIDÆ.

- ✓ *Zeus faber*. A large specimen from the Norwegian coast described by Rasch, Forh. Selsk. Christian. 1871, pp. 500-502.

SCOMBRIDÆ.

- ✓ *Scomber kanagurta* = *Sc. chrysozonus* (Rüpp.), according to Klunzinger, Verh. z.-b. Ges. Wien, 1871, p. 441.
 ✓ *Pelamys nuda* described by Klunzinger, l. c. p. 443.
 ✓ *Pelamys sarda* on the coast of Scandinavia. Malm, Öfv. Sv. Akad. 1870, p. 337.

TRACHINIDÆ.

Aphritis gobio. Notes by Cunningham, Trans. Linn. Soc. xxvii. p. 469. ✓

BATRACHIDÆ.

Batrachus cirrhosus, sp. n., Klunzinger, Verh. z.-b. Ges. Wien, 1871, p. 500, Red Sea.

PEDICULATI.

Dr. LÜTKEN directs attention to an error committed by some ichthyologists, who denied the presence of pseudobranchiæ in this family. Overs. Dan. Selsk. 1871, p. 65.

✓ *Oneirodes eschrichtii*, g. et sp. n., Lütken, l. c. pp. 56-74, tab. 2. Differs from *Melanocetus* in having a horizontal mouth and the dorsal formula 1/1/3. Greenland.—The author mentions also that the so-called palatine and pterygoid teeth of *Melanocetus* belong in reality to the upper pharyngeals, as is also the case with *Oneirodes*.

✓ *Himantolophus grønlandicus* (Reinhardt) compared with *Ceratias*. Lütken, l. c. p. 70.

✓ *Lophius piscatorius*. The spawn has been observed as a floating sheet of mucus, of from some sixty to one hundred square feet. S. F. Baird, Amer. Nat. 1871, v. p. 785.

COTTIDÆ.

✓ *Trigla [pini] cuculus* described from Scandinavian specimens by Malm, Öfv. Sv. Akad. 1870, p. 825.—The author has confirmed the view of several ichthyologists, that ✓ *T. gurnardus* and ✓ *T. blochii* [*cuculus*] are the same species. *Ibid.* p. 829.

✓ *Dactylopterus chirophthalmus* (Blkr.) is the young of *D. orientalis*. Günther, P. Z. S. 1871, p. 663.

Platycephalus cinereus, sp. n., Günther, l. c. p. 661, South Australia.

CATAPHRACTI.

Peristethus liorhynchus, sp. n., Günther, P. Z. S. 1871, p. 663, pl. 62, Manado. — ✓

— *Peristethus engyceros*, sp. n., Günther, l. c. (with woodcut), Sandwich Islands.

✓ *Peristedion micronemus* is described as a new species from Cuba by Poey, Ann. Lyc. N. H. New York, ix. 1870, p. 321.

COMEPHORIDÆ.

✓ *Comephorus baicalensis* has five pyloric appendages. Günther, A. & M. N. H. 1871, viii. p. 292.

GOBIIDÆ.

Gobius. Dr. Klunzinger (Verh. z.-b. Ges. Wien, 1871, pp. 471-479) describes 13 species from the Red Sea, of which *Gobius koseirensis*, p. 474, is new. — *Gobius echinocephalus* is said to be provided with canine teeth, and therefore not distinct from *G. amiciensis*, p. 475.—*Gobius capistratus* = *Gobius ophthalmotenia*, p. 476.

Gobius mucosus, sp. n., Günther, P. Z. S. 1871, p. 663, pl. 63. fig. A, Adelaide.

—*Gobius platystoma*, sp. n., Günther, *l. c.* p. 664, pl. 63. fig. B, North-eastern Australia.—*Gobius leucostictus*, sp. n., Günther, *l. c.* p. 664, pl. 63. fig. C, Tonga Islands.—*Gobius elapoides*, sp. n., Günther, *l. c.* p. 665, pl. 63. fig. D, Japan?

✓ *Gobius microps* (Kröy.) described by Malm, *Öfv. Sv. Akad.* 1870, p. 844; it is allied to *Gobius pictus* (Malm, 1865) = *G. jeffreysii* (Gthr. 1867), *ibid.* p. 848.

Gobius rhodopterus in fresh waters of Algeria. Playfair, A. & M. N. H. 1871, viii. p. 386.

Apocryptes (*Gobiichthys*, subgen. n.) *petersii*, sp. n., Klunzinger, *l. c.* p. 479, Red Sea.

Gobiodon citrinus, sp. n., Klunzinger, *l. c.* p. 480, Red Sea.

Gobiosoma. Dr. Klunzinger (*l. c.*) describes *G. diadematum* (Rüpp.), p. 483, and *Gobiosoma vulgare*, sp. n., p. 484, both from the Red Sea.

✓ *Eleotris*. Mr. Cope (Tr. Am. Phil. Soc. xiv. p. 473) describes as new species ✓ *Culius perniger*, from St. Martins, and ✓ *Culius amblyopsis*, from Surinam.

Eleotris prasinus and *Eleotris polygonatus*, spp. nn., Klunzinger, *l. c.* pp. 481, 482, Red Sea.

✓ *Callionymus lyra*. Male and female figured by Darwin, Descent of Man, ii. p. 8.

Callionymus cookii, sp. n., Günther, P. Z. S. 1871, p. 665, Cook's Islands.

BLENNIIDÆ.

Blennius. Dr. Klunzinger (Verh. z.-b. Ges. Wien, 1871) describes the following species from the Red Sea:—*Blennius hypenetes*, sp. n., p. 492; *Blennius jugularis*, sp. n., p. 493; *Blennius cornifer* (Rüpp.), p. 493; and *Blennius cyclops* = *Salarias cyclops* (Rüpp.) = *Blennius semifusciatus* (Rüpp.), p. 494.

✓ *Blennius gentilis* (California) found at Rio Janeiro by Cunningham, Trans. Linn. Soc. xxvii. p. 470.

2 — *Blennius sordidus* (Sandwich Islands) found in the Bay of Coquimbo by Cunningham, *l. c.*

Petroscirtes. Dr. Klunzinger (*l. c.*) describes *P. tapeinosoma* (Blkr.) and *P. filamentosus* (C. & V.), p. 495; *P. mitratus* (Rüpp.) = *P. barbatus* (Ptrs.), p. 496; *P. ancylodon* (Rüpp.), p. 497, and *Petroscirtes* (*Enchelyurus*) *kraussii*, sp. n., p. 497: all from the Red Sea.

Salarias. Dr. Klunzinger (*l. c.* pp. 486–492) describes nine species from the Red Sea. He gives a lengthy account of the varieties of *S. quadricornis*, one of which is the *S. rivulatus* of Rüppell (p. 486).

✓ [*Clinus*] *Labrisomus biguttatus*, sp. n., Cope, Tr. Am. Phil. Soc. xiv. p. 473, Bahamas.

Cristiceps argentatus in an artesian well on the High Plateaux of Algeria. Playfair, in A. & M. N. H. 1871, viii. p. 387.

Tripterygium obtusirostre, sp. n., Klunzinger, *l. c.* p. 498, Red Sea.—*Enneapterygius pusillus* (Rüpp.) belongs to the same genus, *Id. ibid.*

Pateucus subocellatus, sp. n., Günther, P. Z. S. 1871, p. 655, pl. 64, South Australia.

ATHERINIDÆ.

Atherina rissoi, or a species allied to it, from fresh waters in Algeria, described by Playfair and Letourneux, A. & M. N. H. 1871, viii. p. 387.

Atherinichthys latilavina and *A. microlepidota* probably identical, Cunning-[✓]ham, Trans. Linn. Soc. xxvii. p. 471.

Labidesthes, g. n., proposed by Cope for *Chirostoma sicculum* (see Zool.[✓] Record, ii. p. 192), P. Am. Phil. Soc. 1870, p. 455, fig. 1.

MUGILIDÆ.

Myrus leuciscus, sp. n., Günther, P. Z. S. 1871, p. 666, pl. 65. fig. A, Cook's Islands.

GASTEROSTEIDÆ.

Gasterosteus pungitius. On its nidification, Landois in Zool. Gart. 1871,[✓] pp. 1-10, with figure of nest; and on its distribution in Germany, Martens & Friedel, *ibid.* pp. 28-31.

Gasterosteus brachycentrus in Algeria, Playfair & Letourneux, A. & M. N. II. 1871, viii. p. 388.

FISTULARIIDÆ.

Fistularia villosa, sp. n., Klunzinger, Verh. z.-b. Ges. Wien, 1871, p. 516, Red Sea.

CENTRISCIDÆ.

[✓] *Centriscus gracilis* taken in the towing-net, between Monte Video and the Strait of Magellan, by Cunningham, Trans. Linn. Soc. xxvii. p. 471.

GOBIESOCIDÆ.

[✓] *Gobiesox cerasinus* is described as a new species by Cope, Tr. Am. Phil. Soc. xiv. p. 473, St. Martin's.

LABYRINTHICI.

Osphronemus olfax. Prof. P. Döderlein has published a pamphlet, 'Rapporto della Commissione inviata a Siracusa dalla Società d'Acclimazione di Palermo coll' incarico d'esaminare se le condizioni fisiche del fiume Anapo fossero adatte per acclimarvi il pesce Gurami.' Palermo: 1867. 8vo, pp. 68, with a map and plate. It appears to have been reprinted from 'Atti della Società d'Acclimazione in Sicilia.' It is shown that Sicily would be well adapted for the acclimatization of this fish; but we are not aware that further steps have been taken in the matter.

TRACHYPTERIDÆ.

[✓] *Trachypterus iris*. Its fat is phosphorescent. Panceri, Rendic. Acc. Napol. 1871, April. (See p. 90.)

ACANTHOPTERYGII PHARYNGOGNATHI.

[✓] *Amphiprion bicinctus* = *A. clarkii*, according to Klunzinger, Verh. z.-b. Ges. Wien, 1871, p. 518.

Pomacentrus. Dr. Klunzinger (*l. c.*) mentions six species from the Red Sea, *Pomacentrus sulfureus* (p. 521) being new.

Glyphidodon. Dr. Klunzinger (*l. c.* pp. 523-529) describes seven species

from the Red Sea. He is inclined to reduce considerably the number of species in this genus, but describes one as new, viz. *Glyphidodon cingulum* (p. 526).

Heliaspes dimidiatus, sp. n., Klunzinger, *l. c.* p. 529, Red Sea.

Xiphochilus robustus in the Red Sea, Klunzinger, *l. c.* p. 550.

Cirrhitabrax heterodon, sp. n., Bleeker, Arch. Néerl. 1871, p. 326, fig. 1, Amboyna.

Chilinus. Dr. Klunzinger describes seven known species from the Red Sea. Verh. z.-b. Ges. Wien, 1871, pp. 552-556.

Chilinus bifasciatus, sp. n., Bleeker, Arch. Néerl. 1871, p. 327, fig. 3, Amboyna.—*Chilinus melanopleura* is figured, *ibid.* fig. 2.

Chilinus godeffroyi, sp. n., Günther, P. Z. S. 1871, p. 666, pl. 66, Tonga Islands.

Pseudochilinus hexataenia in the Red Sea, Klunzinger, *l. c.* p. 557.

✓ *PlatyGLOSSUS notopsis*. A black variety noticed by Günther, P. Z. S. 1871, p. 667.

PlatyGLOSSUS nigromaculatus, sp. n., Günther, *l. c.* p. 666, pl. 65, fig. B, Samoa Islands.

Novacula. Dr. Klunzinger describes four known species from the Red Sea. *L. c.* pp. 530-533.

✓ *Julis rueppellii* is a new name given by Klunzinger to *J. purpureus* (Rüpp., nec Forsk.); the true *J. purpureus* of Forskål is identical with *J. trilobatus* (Lacép.). Verh. z.-b. Ges. Wien, 1871, p. 536.

✓ *Coris cingulum* is stated to be the young state of *Coris aygula* by Klunzinger, *l. c.* p. 539.

✓ *Scarus hoplomystax* described as a new species from St. Martin's by Cope, Tr. Am. Phil. Soc. xiv. p. 462.

✓ *Cryptotomus*, g. n., Cope, Trans. Am. Phil. Soc. xiv. p. 462. Dentition of *Callyodon*; 11 dorsal spines; one row of scales on the cheek.—*Cryptotomus roseus*, sp. n., Cope, *l. c.* p. 462, fig. 1, St. Martin's.

Pseudoscarus. Dr. Klunzinger (*l. c.* pp. 559-570) distinguishes, beside several varieties, 10 species from the Red Sea; he differs from his predecessors in some points of the synonymy.

✓ *Pseudoscarus diadema*, considered to be a distinct species, and described by Cope, Tr. Am. Phil. Soc. xiv. p. 461.

✓ *Coridodax pullus* figured by Knox in T. N. Z. Inst. iii. p. 130, pl. 18, fig. 2. Vertebræ 27/21.

✓ *Chromides*. On sexual differences and nidification of some South-American species, see Darwin, Descent of Man, ii. pp. 13, 20.

✓ *Hemichromis subocellatus*, sp. n., Günther, P. Z. S. 1871, p. 667, pl. 67, fig. C, Gaboon.

✓ *Acara flavilabris*, sp. n., Cope, P. Am. Phil. Soc. 1870, p. 570, Pebas.

✓ *Crenicichla cyanonotus* and *Crenicichla lucius* are described as new species from Pebas by Cope, *l. c.* pp. 569, 570.

ANACANTHINI.

Dr. BLEEKER's 24th part of the 'Atlas Ichthyologique,' which contains figures of a part of the East-Indian species of *Pleuronectidae*, has been noticed above, p. 89.

✓ *Lycodes sarsii*, sp. n., Collett, Förh. Selsh. Christian. 1871, pp. 62-66, with a plate, Hardangersfjord, Norway.

✓
Maynea, g. n. Lycodid., Cunningham, Trans. Linn. Soc. 1871, xxvii. p. 471. Skin with small imbedded scales; vertical fins united; ventrals none. Jaws equally armed anteriorly with minute teeth placed rather far apart. A few minute teeth on the vomer and anteriorly on the palatines. Gill-opening narrow, the gill-membranes being attached to the isthmus; pseudo-branchiæ absent. No pyloric appendages.—*Maynea patagonica*, sp. n., Cunningham, l. c. p. 472, Otter Islands.—D. 115, A. 85.

Blenodesmus, g. n. Lycodid., Günther, P. Z. S. 1871, p. 667. Body band-like, with rudimentary scales. Lateral line indistinct. Eye of moderate size. Snout pointed, lower jaw prominent. Small conical teeth in both jaws; palate smooth. Barbels none. Ventral fins reduced to two small and short filaments, jugular.—*Blenodesmus scapularis*, sp. n., Günther, l. c. p. 667, pl. 67. fig. A, N.E. Australia.—D. + C. + A. 50 + 9 + 40.

✓
Merluccius gayi characterized by Cunningham, Trans. Linn. Soc. xxvii. ✓
 p. 472.

Pseudophycis peregrinus, sp. n., Günther, P. Z. S. 1871, p. 669, Manado.

✓
Couchia is probably the young of *Motella*. Günther, A. & M. N. H. 1871, viii. p. 320.

Brotula multibarbata from the Red Sea. Klunzinger, Verh. z.-b. Ges. Wien, 1871, p. 574.

Halidesmus, g. n. Brotulin., Günther, P. Z. S. 1871, p. 668. Body band-like, with minute scales. Three lateral lines on each side. Eye of moderate size. Dorsal and anal not continuous with the caudal. Ventral fins reduced to a pair of short filaments. A series of conical teeth in each jaw, none on the palate. Lower jaw rather projecting. Barbels none. Gill-opening wide.—*Halidesmus scapularis*, sp. n., Günther, l. c. pl. 67. fig. B, Port Natal.—D. 64, A. 48.

✓
Haliophis guttatus, described by Klunzinger, Verh. z.-b. Ges. Wien, 1871, ✓
 p. 575.

Coryphænoides novæ-zelandiæ, sp. n., Hector, T. N. Z. Inst. iii. p. 136, pl. 18. f. 1. [This is the type of a distinct genus, for which the Recorder proposes the name of *Macruronus*.]

✓
Rhomboidichthys pantherinus (?) described by Klunzinger, Verh. z.-b. Ges. Wien, 1871, p. 571.

✓
Plagusia dipterygia (Rüpp.) = *P. marmorata* (Blkr.) = *Pleuronectes bilineatus* (Bl.), according to Klunzinger, l. c. p. 573.

PHYSOSTOMI.

SILURIDÆ.

Mr. F. DAY has published some notes on the air-bladder of several Indian genera; he has found it similar in structure to that of the Loaches in *Hemipimelodus* and *Glyptosternum telchitta*. P. Z. S. 1871, pp. 286–289.—He has continued these examinations (*ibid.* pp. 703–721); and considering whether, “amongst these freshwater groups, any general law of distribution holds good which may furnish one with a clue to the reason for the existence of this osseous covering, whether such

is for protection or whether a part of the auditory apparatus," he comes to the following conclusions:—

"That the necessity for this bony capsule to the air-vessel is greater in India and Burmah than in the Malay archipelago.

"That this protection is for the freshwater and not for the marine Siluroids.

"That no true Indian, wholly marine Siluroid has its air-vessel enclosed in bone.

"That amongst the Siluroids of the hilly regions, those which ascend rivers having alpine sources have the air-vessel enclosed in bone.

"That those which ascend rivers not snow-fed do not appear of necessity to have their air-vessels thus protected."

Copidoglanis brevidorsalis. Prof. Troschel having received a female without ventral fins, regards their absence as a sexual character in this species, which peculiarity, he thinks, is evidence in favour of maintaining the genus *Neosilurus*. Wiegmann. Arch. 1871, pp. 276-280. [Having examined several specimens of this species, the Recorder is inclined to consider the apodal specimen examined by Prof. Troschel a case of individual monstrosity, as he has seen it also in *Erythrinus*, *Ophiocephalus*, &c.]

Callichrous egertonii, sp. n., Day, P. Z. S. 1871, p. 710, Punjab.

Ailichthys, g. n., Day, P. Z. S. 1871, p. 712. Differs from *Ailia* by the absence of ventral fins.—*Ailichthys punctata*, sp. n., Day, l. c. p. 713, Jumna.

Pseudeutropius longimanus (Gthr.) and *Hypophthalmus taakree* (Sykes), Day, P. Z. S. 1871, p. 635, and Günther, *ibid.* p. 762.

Macrones nangra (H. B.) is described by Day, P. Z. S. 1871, p. 288; *Macrones carcio* (H. B.), *ibid.* p. 705; *Macrones tengara* and *tengana*, p. 706.

Macrones vittatus (Bl.) = *Bagrus oculus* (C. & V.) = *Bagrus montanus*, &c. (Jerd.) = *Macrones armatus* (Day), according to Day, P. Z. S. 1871, p. 706.

Macrones menoda (H. B.) = *Bagrus trachacanthus* (C. & V.), according to Day, l. c.

Akysis kurzii, sp. n., Day, P. Z. S. 1871, p. 703, Pegu.

Olyra. Mr. Day characterizes this genus, and describes as a new species *Olyra burmanica*, P. Z. S. 1871, p. 711.

Amiurus. Prof. Cope makes remarks on the species recognized by him, and describes as new *A. mispilliensis*, *A. lophius*, and *A. niveiventris*. P. Am. Phil. Soc. 1870, pp. 485-489.

Pimelodus. *Pseudorhamdia piscatrix* and *Rhamdia cyanostigma*, spp. nn., Cope, l. c. p. 569, from Pebas.

Glyptosternum telchitta (H. B.) described by Day, P. Z. S. 1871, p. 288.

Glyptosternum modestum, sp. n., Day, l. c. p. 714, Jumna.

Hara elongata, sp. n., Day, P. Z. S. 1871, p. 704, Garro Hills.

✓ *Doras pectinifrons*, sp. n., Cope, P. Am. Phil. Soc. 1870, p. 568, Pebas.

Arges and *Stygogenes*. *Pimelodus cyclopum* (Humb.) = *Arges brachycephalus* (Gthr.) = *Stygogenes humboldtii* (Gthr.), according to Putnam, Amer. Nat. 1871, v. p. 694. [Induced by the remarks made by Mr. Putnam, the Recorder has reexamined the typical specimens of the two latter species, especially with regard to the presence of a hard spine in the adipose fin of *Arges*. In an example 4 inches long no such spine can be found under the skin. Consequently, if Mr. Putnam's supposition is correct notwithstanding, we

should arrive at the following conclusions:—1. *Arges sabalo* could not be kept generically distinct from these fishes (as Mr. Putnam is inclined to keep it), inasmuch as doubts might be entertained of the *specific* distinctness of *A. sabalo* and *A. brachycephalus*. 2. The adipose fin would undergo extraordinary changes in these fishes during their growth: in examples up to 2 inches (*Stygogenes humboldtii*) it is very short, close to the caudal fin, and provided with a hard spine. In other examples (Mr. Putnam's specimen; the length is unfortunately not stated by Mr. Putnam) "the adipose fin is moderately long, reaching to the base of the upper caudal ray, with a short broad spine at its front base buried in the skin." Finally, in specimens from 4 to 9 inches (*A. brachycephalus*) the adipose fin extends from near the dorsal to the caudal, without a trace of hard spine. Such an extraordinary change is not without parallel in the class of fishes; but we should like to see further evidence in proof of this case.]

Plecostomus barbatus. Head of male and female figured by Darwin, Descent of Man, ii. p. 11.

Hypoptopoma bilobatum, sp. n., Cope, P. Am. Phil. Soc. 1870, p. 566, fig., Pebas.

Exostoma blythii. Note by Day, P. Z. S. 1871, p. 715.

Bunocephalus aleuopsis, sp. n., Cope, P. Am. Phil. Soc. 1870, p. 568, Pebas.

Eremophilus mutisii (Humboldt) has not been recognized by Giebel, who describes it as *Trachypoma marmoratum* (g. et sp. n.); the author was also not aware that the generic name proposed by him is preoccupied. Z. ges. Ntrw. 1871, iii. p. 97.

CYPRINIDÆ.

An important memoir, 'Sur les Cyprinoïdes de Chine,' has been published by Dr. BLEEKER in Verh. Akad. Amsterd. xii. 1871, p. 91, with 15 double plates. A preliminary notice appeared last year, and was referred to in Zool. Record, vii. p. 83. The author gives an historical sketch of the progress of our knowledge respecting this part of the Chinese fauna. Before this paper 50 species (the *Cobitidæ* not included) had been described, unfortunately many from Chinese drawings only; and to this number the author adds now 21 others, chiefly from the Yantsekiang, where the specimens were collected by Messrs. Daubry and the Abbé David. The Cyprinoids of China show a close affinity to those of Japan and Europe, whilst the forms most characteristic of the tropical parts of the Indian region have disappeared. The memoir is beautifully illustrated, apparently regardless of expense.

F. DAY, in a "Monograph of Indian Cyprinidæ," characterizes 24 known genera. J. A. S. B. 1871, p. 102.

Catostomus. Prof. Cope describes the following as new species (P. Am. Phil. Soc. 1870):—p. 467, *Placopharynx* (g. n.) *carinatus*; p. 470, *Ptychostomus papillosus* and *velatus*; p. 471, *P. collapsus* and *pidiensis*; p. 472, *P. coregonus*, *albus*, and *thalassinus*; p. 473, *P. robustus*; p. 474, *P. lachrymalis*; p. 477,

P. crassilabris; p. 478, *P. breviceps* and *comus*. These descriptions are mixed with notes on previously described species.

Carpiodes. Prof. Cope (*l. c.*) describes as new species;—p. 480, *C. difformis*; p. 481, *C. cutisanterinus* and *C. selene*; p. 482, *C. grayi*; p. 484, *C. nummifer*; adding remarks on previously named species.

Cyprinus auratus. The osteology of monstrosities. Pouchet in Robin's Journ. Anat. 1870-71, pp. 561-569, pl. 17.

Cirrhitina anisura (M'Cl.) and *dyochilus* (M'Cl.) described by Day, J. A. S. B. 1871, p. 136.

(*Cyprinus*) *bata*. H. Buchanan's original drawing reproduced by Günther, P. Z. S. 1871, p. 765.

Dangila berdmorei (Blyth) described by Day, J. A. S. B. 1871, p. 134.

Gobio isurus (M'Cl.) described by Day, *l. c.* p. 142 [and proves to belong to *Dangila*].

Osteochilus. *Rohita rostellatus* (C. & V.) proves to belong to this genus, and is described by Day, J. A. S. B. 1871, p. 130.—*Osteochilus neilli* figured, *ibid.* pl. 9. fig. 5, *a, b*.

Labeo nandina (H. B.) = *Labeo macronotus* (M'Cl.), according to Day, J. A. S. B. 1871, p. 113.—*Labeo fimbriatus* (Bl.) = *L. leschenaultii* (C. & V.) = *Varicorhinus bobree* (Sykes), according to Day, *l. c.* p. 114.—*Labeo calbasu* (H. B.) = *Cirrhinus affinis* (Jerdon) = *Tylognathus porcellus* (Heck.), according to Day, *l. c.* p. 116.—*Labeo cursa* (H. B.) = *L. microlepidotus* (C. & V.), according to Day, *l. c.*—*Labeo pontius* (Jerd.) = *Cirrhinus rubropunctatus* (Jerd.), according to Day, *l. c.* p. 118.

Gobio bicolor of M'Clelland proves to be a *Labeo*, and is described by Day, *l. c.* p. 126.

Crossochilus reba. Mr. Day thinks that the *Chondrostoma gangeticum* (C. & V.) was intended for this species [as already suggested by the Recorder]. J. A. S. B. 1871, p. 142.

Crossochilus rostratus (Gthr.) and *Cyprinus bata* (H. B.), Day, P. Z. S. 1871, p. 636, and Günther, *ibid.* p. 764.

Gymnostomus macrolepis, sp. n., Bleeker, Verh. Akad. Amsterd. xii. 1871, p. 32, tab. 8. fig. 2, Yantsekiang.

Barbus. Bleeker (Verh. Akad. Amsterd. xii. 1871) describes three new species from the Yantsekiang:—*Barbodes sinensis*, p. 17, tab. 3. fig. 2; *Hemibarbus maculatus*, p. 19, tab. 4. fig. 3; and *Hemibarbus dissimilis*, p. 21, tab. 6. fig. 1.

Barbus fasciolatus (Günth. Fish. vii. p. 140). Dr. Bleeker proposes for this species the name of *B. guentheri*, *l. c.* p. 9 [but the name was changed by Günther himself into *semifasciolatus*, vii. p. 484].

Barbus. For Mr. Day's interpretations of the synonymy of Indian Barbels we refer to J. A. S. B. 1871, pp. 291-336.

Barbus (*Puntius*) *punjabensis*, sp. n., Day, *l. c.* p. 334.

Barbus beavani (Gthr.) and *Cyprinus chagunio* (H. B.), Day, P. Z. S. 1871, p. 637, and Günther, *ibid.* p. 764.

Barbus callensis and *B. setifensis* described by Playfair and Letourneux, A. & M. N. II. 1871, viii. p. 392.—The authors confirm Dr. Günther's determination of *Barbus longiceps* as a Syrian species.

Thynnichthys harengula (C. & V.) described by Day, J. A. S. B. 1871, p. 283, pl. 21. fig. 8.

Schizothorax. Mr. Day describes the species of this genus, J. A. S. B. 1871, pp. 338-348.

Pseudogobio sinensis (Kner)=*Gobio rivularis* (Basil.), Bleeker, Verh. Ak. Amsterd. xii. 1871, p. 23, tab. 8. fig. 1.

Sarcochilichthys sinensis, sp. n., Bleeker, l. c. p. 31, tab. 4. fig. 2, Yantsekiang.

Saurogobio dumerilii and *Saurogobio dabryi*, spp. nn., Bleeker, l. c. p. 25, tab. 1. fig. 1, and p. 29, tab. 5, Yantsekiang.

Rhinogobio typus, sp. n., Bleeker, l. c. p. 29, tab. 3. fig. 1, Yantsekiang.

Ceratichthys labrosus and *Ceratichthys hypsinotus* are described as new species from North Carolina by Cope, P. Am. Phil. Soc. 1870, p. 458.

Hybopsis niveus, *Hybopsis chlorocephalus*, and *Hybopsis chiliticus* are described as new species from North Carolina by Cope, l. c. pp. 460, 461, 462.

Hemitremia vittata, g. et sp. n., Cope, l. c. p. 462, Tennessee.

Photogenys pyrrhomelas is described as a new species from North Carolina by Cope, l. c. p. 463.

Alburnellus altipinnis and *Alburnellus matutinus* are described as new species from North Carolina by Cope, l. c. pp. 464, 465.

Hybognathus osmerinus, described as a new species from New Jersey by Cope, Proc. Am. Phil. Soc. 1870, p. 466, is figured by Abbott, Am. Nat. 1871, iv. p. 717.

Amblypharyngodon mola (H. B.)=*A. pellucidus* (M'Cl.), according to Day, J. A. S. B. 1871, p. 284.—The same writer states that *Mola atkinsonii* (Blyth) is a distinct species, p. 285.

Semiplotus modestus figured by Day, l. c. 1871, pl. 21. fig. 1.

Xenocypris. Dr. Bleeker, l. c., describes four new species of this genus from the Yantsekiang:—*X. macrolepis*, p. 53, tab. 5. fig. 2; *X. tapeinosoma*, p. 55, tab. 11. fig. 1; *X. davidi*, p. 56, tab. 6. fig. 4; and *X. microlepis*, p. 58, tab. 9.

Leuciscus aethiops (Basil.)=*L. dubius* (Blkr.) described by Bleeker, l. c. p. 45, tab. 14. fig. 1.

Leuciscus callensis described by Playfair and Letourneux, A. & M. N. H. 1871, viii. p. 391.

Ctenopharyngodon idellus figured by Bleeker, l. c. p. 47, tab. 10. fig. 2; the author refers this genus to *Leuciscus*.

Achilognathus imberbis (Gthr.). The fish described and figured by Bleeker (l. c. p. 37, tab. 4. fig. 1) under this name appears to be a distinct species.

Rhodeus ocellatus figured by Bleeker, l. c. tab. 6. fig. 3. *Rhodeus sinensis*, described *ibid.* p. 35.

Acanthorhodeus. Of this genus, which we noticed in last year's Record, Dr. Bleeker (l. c.) describes three new species from the Yantsekiang:—*A. macropterus*, p. 40, tab. 2. fig. 2; *A. guichenoti*, p. 41, tab. 13. fig. 2; and *A. hypselonotus*, p. 43, tab. 11. fig. 2.

Aspidoparia sardina (Heck.)=*Cyprinus morar* (H. B.), and *Aspidoparia jaya* (H. B.)=*Leuciscus margarodes* (M'Cl.), described by Day, J. A. S. B. 1871, pp. 361, 362.

Barilus acutipinnis, sp. n., Bleeker, l. c. p. 81, tab. 13. fig. 1, Yantsekiang.

Squaliobarbus curriculus figured by Bleeker, l. c. p. 48, tab. 13. fig. 3.

Hypophthalmichthys molitrix and *nobilis* figured by Bleeker, l. c. p. 83, tab. 12. fig. 4, and p. 85, tab. 14. fig. 2.

Chanodichthys mongolicus figured by Bleeker, *l. c.* p. 62, tab. 2. fig. 3.

Hemiculter leucisculus. Under this name specimens believed to be the *Culter leucisculus* (Basil.) are described and figured by Bleeker, *l. c.* p. 70, tab. 2. fig. 1.

Chanodichthys bramula is generically separated by Bleeker as *Parabramis*, *l. c.* p. 78, tab. 7. fig. 2.

Pseudobrama dumerili, sp. n., Bleeker, *l. c.* p. 60, tab. 7. fig. 1, Yantsekiang.

Luciobrama typus, sp. n., Bleeker, *l. c.* p. 51, tab. 1. fig. 2, Yantsekiang.

Culter. Dr. Bleeker (*l. c.*) describes four species from the Yantsekiang: *C. ilishæformis*, sp. n., or perhaps = *C. erythropterus* (Basil.), p. 67, tab. 10. fig. 1; *C. brevicauda* (Gthr.), p. 69, tab. 11. fig. 3; *C. dabryi*, sp. n., p. 70, tab. 12. fig. 2; *C. hypselonotus*, sp. n., p. 72, tab. 8. fig. 3; and *C. oxycephalus*, sp. n., p. 74, tab. 5. fig. 3.

Psilorhynchus balitora described by Day, *l. c.* p. 106, pl. 9. fig. 1.

Cobitis tænia. Prof. Canestrini has found that the male has the upper pectoral ray enlarged. *Rivista Scient.-Industr.* 1871, Jun. fasc. iii., translated in *Arch. für Naturg.* 1871, pp. 222-224; also in *Zeitschr. wiss. Zool.* 1871, xxi. pp. 538, 539. [It is the same sexual difference which has been known for some time in an Indian Loach (*Lepidocephalichthys thermalis*). See Günther, *Fish.* vii, p. 364.]

CHARACINIDÆ.

Holotaxis, g. n., Cope, P. Am. Phil. Soc. 1870, p. 563. *Pyrrhulina*, with maxillary teeth.—*Holotaxis melanostomus*, sp. n., Cope, *l. c.*, Pebas.

Plethodectes, g. n., Cope, P. Am. Phil. Soc. 1870, p. 563. Differs from *Piabucina* in the dentition, having the intermaxillary teeth in a double series, the outer teeth being conical. Mandibular teeth tricuspid, in an outer series, with two conical teeth in the middle behind that series.—*Plethodectes erythrurus*, sp. n., Cope, *l. c.* c. fig., Pebas.

Tetragonopterus. Prof. Cope (P. Am. Phil. Soc. 1870, pp. 559, 560) describes the following as new species from the River Amazons:—*T. orientalis*, *T. stilbe*, *T. hauxwellianus*, *T. pectinatus*, and *Hemigrammus robustulus*.

Stethaprion, g. n., Cope, P. Am. Phil. Soc. 1870, p. 562. Appears to differ from *Tetragonopterus* in its small scales.—*Stethaprion erythrops*, sp. n., Cope, *l. c.* c. fig., Pebas.—D. 12, A. 40, L. lat. 61.

Nannæthiops, g. n. *Tetragonopterin.*, Günther, P. Z. S. 1871, p. 669. Dorsal fin in the middle of the body, above the ventrals; anal short; adipose fin small. Scales of moderate size. Belly rounded. Lateral line present. Mouth narrow. Teeth small, uniserial, with a simple notch. Maxillary and palate toothless.—*Nannæthiops unitaniatus*, sp. n., Günther, *l. c.* p. 670, pl. 65. fig. C, Gaboon.

Odontostilbe, g. n., Cope, P. Am. Phil. Soc. 1870, p. 566. Differs from *Chirodon* in having a complete lateral line and a few maxillary teeth.—*Odontostilbe fugitiva*, sp. n., Cope, *l. c.* Pebas.

Ræboides bicornis, sp. n., Cope, *l. c.* p. 564, Pebas.—*Anacyrtus tectifer*, sp. n., Cope, *l. c.* p. 565, Pebas.—*Cynopotamus gulo*, sp. n., Cope, *l. c.*, Pebas. *Myletes lippincottianus*, sp. n., Cope, *l. c.* p. 561, c. fig.

CYPRINODONTIDÆ.

- ✓ *Cyprinodon dispar* described by Klunzinger, Verh. z.-b. Ges. Wien, 1871, p. 587.
- ✓ *Cyprinodon iherus* distinct from *C. calaritanus*, described by Playfair & Letourneux, A. & M. N. H. 1871, viii. p. 390.
- ✓ *Tellia apoda* described by Playfair & Letourneux, l. c.
- ✓ *Lycocyprinus* (Ptrs.) = *Epiplatys* (Gill); *Epiplatys sexfasciatus* (Gill) not = *Lycocyprinus sexfasciatus* (Ptrs.), which = *Haplochilus infrafasciatus* (Gthr.), according to Cope, P. Am. Phil. Soc. 1870, p. 457.
- ✓ *Haplochilus melanops* is described as a new species by Cope, l. c., North Carolina.
- ✓ *Fundulus nisorius* is described as a new species by Cope, l. c., p. 456, Gaboon.

SCOMBRESOCIDÆ.

Dr. KLUNZINGER proposes to place these fishes as a suborder of *Physostomi*, under the name of *Physostomi pharyngognathi*. Verh. z.-b. Ges. Wien, 1871, p. 576.

Dr. BLEEKER's 24th part of the 'Atlas Ichthyologique,' which contains the text of the description of the East-Indian species of *Scombresocidæ*, has been noticed above, p. 89.

Belone. Dr. Klunzinger (l. c.) describes the following from the Red Sea:—*B. platura* (Rüpp.) ? = *B. carinata* (C. & V.), p. 577; *B. choram*, p. 578; *B. koseirensis*, sp. n., p. 579; *B. robustus*, *ibid.*; *B. appendiculatus*, sp. n., p. 580; and *B. melanostigma* (C. & V.) = *B. schismatorhynchus* (Blkr.), p. 581.

Belone punctulata, sp. n., Günther, P. Z. S. 1871, p. 670, Manado.

✓ *Belone diplotænia*, sp. n., Cope, Tr. Am. Phil. Soc. xiv. p. 481, St. Martin's.

Hemirhamphus. Dr. Klunzinger (l. c. pp. 582–585) has determined the species collected by him in the Red Sea as *H. far*, *marginatus*, *dussumieri*, and *gamberur*, and directs attention to various discrepancies between his descriptions and those of some of his predecessors.—Note on *Hemirhamphus dispar* from Mossambique by Peters, MB. Ak. Berl. 1871, p. 32.—*Hemirhamphus gamberur* described by Günther, P. Z. S. 1871, p. 671.

Hemirhamphus acutus, sp. n., Günther, l. c. p. 671, Cook's Islands.

Exocætus bahiensis, from the Red Sea, Klunzinger, l. c. p. 585. The same author describes as a new species *Exocætus gryllus* [but this is identical with *E. atrodorsalis*, Gthr.].

✓ *Exocætus scylla*, sp. n., Cope, Tr. Am. Phil. Soc. xiv. p. 481, Gulf of Mexico.

STERNOPTYCHIDÆ.

Argyroleucus elongatus, sp. n., Esmark, Förh. Selsk. Christian. 1871, p. 489. The length of the body (without caudal) is more than twice its depth, and thrice the length of the head. Angle of the præoperculum with a spine bent forwards. Tail with 3 spines above and 1 below. D. 2/9, A. 15?—Chinese Sea.

Maurolicus tripunctulatus, sp. n., Esmark, Förk. Selsk. Christian. 1871, p. 489. The height of the body equals the length of the head, and is $3\frac{1}{2}$ in the total (without caudal). The base of the dorsal equal to the distance of

the extremity of the snout or of the base of the caudal from the vertical from the first anal rays. A series of black pigment-laminæ (lateral line) proceeds from the shoulder; on each side, from the vent to the root of the caudal, a series of five equidistant black laminæ; the first, second, and third of these laminæ include three silvery dots, the fourth two, and the fifth four. D. 9-10, A. 24?—Madagascar.

Maurolicus mucronatus, sp. n., Klunzinger, Verh. z.-b. Ges. Wien, 1871, p. 593, Red Sea.

SCOPELIDÆ.

Saurus erythræus, sp. n., Klunzinger, Verh. z.-b. Ges. Wien, 1871, p. 590, Red Sea.

Scopeus cæruleus, sp. n., Klunzinger, l. c. p. 592, Red Sea.

STOMIATIDÆ.

Astronesthes martensii, sp. n., Klunzinger, Verh. z.-b. Ges. Wien, 1871, p. 594, Red Sea.

SALMONIDÆ.

✓ *Salmo salar*. Observations made in Bohemia by A. Fritsch, in Arch. Landesdurchf. Böhm. ii. 1871, reprinted Zool. Gart. 1871, pp. 227-229.

✓ *Osmerus*. ✓ Prof. Cope distinguishes from *O. viridescens* (= *O. sergeanti*, Norris) an *O. spectrum* and *O. abbotti* as new species from Maine. P. Am. Phil. Soc. 1870, p. 490.

✓ *Retropinna richardsonii* figured by Hector in T. N. Z. Inst. iii. pl. 18. fig. 3. — *Retropinna osmeroides*, sp. n., Hector, l. c. p. 134, pl. 19. fig. 1, New Zealand.

✓ *Thymallus vulgaris*. A detailed account of the natural history of the Grayling, by J. Warnimont. Publicat. de l'Institut. de Luxemb. xi. pp. 1-48.

HAPLOCHITONIDÆ.

✓ *Prototroctes oxyrhynchus* (Gthr.) described by Hector as *Retropinna upokororo* (sp. n.), T. N. Z. Inst. iii. p. 134, pl. 18. fig. 4, & pl. 19. fig. 2 (*Coregonus opokororo*).

MORMYRIDÆ.

✓ *Mormyrus lepturus*, sp. n., Günther, P. Z. S. 1871, p. 670, pl. 69. fig. B, Gaboon.

CLUPEIDÆ.

Dr. BLEEKER's 24th part of the 'Atlas Ichthyologique,' which contains figures of a part of the East-Indian species, has been noticed above, p. 89.

Engraulis heterolobus (Rüpp.) and *Engraulis baelama* (Forsk.) described by Klunzinger, Verh. z.-b. Ges. Wien, 1871, pp. 596, 597; and the latter species described also by Günther, P. Z. S. 1871, p. 671.

Clupea. Dr. Klunzinger (l. c. pp. 598-601) has determined species collected by him in the Red Sea as *C. liogaster*, *sirm*, *koval*, *venenosa*, and *quadrimaculata*. His account should be consulted on account of the synonymy.

Clupea sprattus on the coast of Tasmania. Günther, P. Z. S. 1871, p. 672.

Spratelloides gracilis. A fish from the Red Sea, so determined, is described by Klunzinger, *l. c.* p. 601.

MURÆNIDÆ.

[*Anguilla australis*?]. "On the absence of the Eel from the upper waters of the Waiata-ua and its Tributaries" (New Zealand), by W. T. L. Travers, T. N. Z. Inst. iii. pp. 120-122.

✓ *Anguilla obscura*, sp. n., Günther, P. Z. S. 1871, p. 673, Feejee Islands.

✓ *Conger cinereus* described by Klunzinger, Verh. z.-b. Ges. Wien, 1871, p. 607.

Peciloconger, g. n. Anguillin., Günther, P. Z. S. 1871, p. 673. Scaleless. Head pointed, without muciferous cavities. Cleft of the mouth extending to below the eye. All the teeth in villiform bands. Pectoral and vertical fins well developed, the dorsal commencing in advance of the gill-opening. Nostrils small, the anterior without tube. Eyes large, without orbital fold. *Peciloconger fasciatus*, sp. n., Günther, *l. c.* pl. 68, Manado.

✓ *Chilorhinus suensonii* redescribed by Cope, Tr. Am. Phil. Soc. xiv. p. 482.

Muraenichthys gymnotus (Blkr.) from the Red Sea, Klunzinger, *l. c.* p. 608.

Ophichthys arenicola is described as a new species from the Red Sea by Klunzinger, *l. c.* p. 609.

Ophichthys melanotenaria occurs in the Red Sea, Klunzinger, *l. c.* p. 612.

Ophichthys stenopterus, sp. n., Cope, Tr. Am. Phil. Soc. xiv. p. 482, Japan.

✓ *Holopterura*, g. n., Cope, Tr. Am. Phil. Soc. xiv. p. 482. "Sphagebranchus with caudal fin."—*Holopterura plumbea*, sp. n., Cope, *l. c.*, West Africa.

Muraena. Dr. Klunzinger (*l. c.* pp. 613-620) describes ten species from the Red Sea. *M. hemprichii*, p. 613, and *M. corallina*, p. 614, spp. nn.—*M. geometrica* (Rüpp.) = *M. bilineata* (Rüpp.) is a distinct species, p. 617.

✓ *Muraena chilensis*, sp. n., Günther, P. Z. S. 1871, p. 674.—*Muraena tanioides*, sp. n., Günther, *l. c.*, Savay.

✓ *Gymnothorax nigrocastaneus* is described as a new species by Cope, Tr. Am. Phil. Soc. xiv. p. 483, St. Martin's. ✓ *Gymnothorax obscuratus* is described as a new species from Cuba by Poey, Ann. Lyc. N. H. New York, ix. 1870, p. 320.

LOPHOBANCHII.

Prof. CANESTRINI believes that in Lophobranchs a coitus takes place, during which the ova are transferred from the female to the male, which fecundates them after they have entered the ovigerous sac. [If this be so, a concourse of the sexes might be assumed also in the Siluroid genus *Aspredo*.] In young *Hippocampus* he has discovered a caudal fin, as Fries also had found rudiments of fins in young *Nerophis*. The author relies on these facts to establish the genealogy of some of the genera: *Nerophis* is descended from *Syngnathus*, and *Hippocampus* from *Calamostoma*; besides, *Nerophis* is a genus in process of formation. The paper is concluded with a descriptive and analytical catalogue of the Lophobranchs of the Adriatic—*Hippocampus* with 2, *Siphonostomus* with 2, *Syngnathus* with 6, and *Nerophis* with 2 species. Att. Ist. Venet. xvi. 1871, or Bibl.

Univ. 1871, July 15, pp. 355-358; or A. & M. N. H. 1871, viii. pp. 215-217.

Solenostoma cyanopteron occurs in the Red Sea. Klunzinger, Verh. z.-b. Ges. Wien, 1871, p. 654.

Syngnathus. Dr. Klunzinger describes four species from the Red Sea, l. c. pp. 648-652.—*Syngnathus flavofasciatus* (Rüpp.) = *S. conspicillatus* (Jen.).

✓ *Syngnathus algeriensis* described by Playfair and Letourneux, A. & M. N. II. 1871, viii. p. 393.

✓ *Hippocampus fuscus* (Rüpp.) described by Klunzinger, l. c. p. 653.

PLECTOGNATHI.

Balistes. Dr. Klunzinger describes 8 known species from the Red Sea. Verh. z.-b. Ges. Wien, 1871, pp. 621-631. *B. rivulatus* (Rüpp.) = *B. fuscus* (Bl.).

✓ *Balistes*. Mr. Cope (Tr. Am. Phil. Soc. xiv. p. 478) describes as new species from St. Martin's *B. moribundus*, *B. asperrimus*, and *B. melanopterus*.

Monacanthus. On sexual differences, Darwin, Descent of Man, ii. p. 12.

✓ *Monacanthus*. Mr. Cope (Tr. Am. Phil. Soc. xiv.) describes the following as new species: ✓ *M. davidsonii*, Florida Reef, p. 476; *M. spilnotus*, Gulf of Mexico, p. 476; *M. amphioxys*, St. Martin's, p. 477; *M. homopterus*, Australia, p. 477; *M. hypargyreus*, Australia, p. 477; and believes he has recognized *M. (Balistes) sandwichensis* (Q. & G.), p. 477.

✓ *Ostracion trigonus*. The young state is described by Cope as a new species, *Ostracium expansum*. Tr. Am. Phil. Soc. xiv. p. 474, figs. 9 & 10.

Cibotium fissum is described as a new species by Cope, l. c. Indian or Pacific Ocean?

✓ *Ostracion cyanurus* (Rüpp.) is a distinct species according to Klunzinger, Verh. z.-b. Ges. Wien, 1871, p. 636.

Tetrodon. Dr. Klunzinger describes nine species from the Red Sea, Verh. z.-b. Ges. Wien, 1871, pp. 637-647, one being regarded as new, *Tetrodon pusillus*, p. 645. He considers *T. margaritatus* (Rüpp.) and *T. papua* (Blkr.) to be identical, p. 646.

Tetrodon pleurostictus, sp. n., Günther, P. Z. S. 1871, p. 674, pl. 69. fig. A, N.E. Australia.

Tetrodon florealis from the Sandwich Islands, and *Arothron ophryas* from the Navigator Islands, are described as new by Cope, l. c. p. 479.

✓ *Orthogoriscus*. *Ostracion boops* (Richards.) represents a still younger state of *Orthogoriscus* than *Acanthosoma*: Lütken, A. & M. N. H. 1871, viii. p. 320.

Orthogoriscus mola in the Red Sea, Klunzinger, l. c. p. 648. An adult example figured by W. Andrews, P. Dublin Soc. vi. pl. 2.—On the venæ portæ renalis and other anatomical points, also measurements of a large example: Jourdain, Comp. Rend. 1871, lxxiii. pp. 1225-1229.

✓ *Orthogoriscus oblongus*. An example from the Irish coast described and figured by W. Andrews. P. Dublin Soc. vi. pp. 56-61, pl. 1.

CYCLOSTOMATA.

Geotria allporti, sp. n., Günther, P. Z. S. 1871, p. 675, pl. 70, Tasmania.

MOLLUSCA

BY

EDUARD VON MARTENS, M.D., C.M.Z.S.

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——. Descriptions of eight new Australian Land-Shells. Ibid. p. 639.

——. Descriptions of seven new species of the genus *Helix* and of two Fluvial Shells from Tasmania. Ibid. p. 696.

——. Remarks on previously described species of Land-Shells. Ibid. p. 699.

——. Description d'espèces nouvelles de Coquilles marines des côtes d'Australie. J. de Conch. xviii. pp. 300 & 301.

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- . Diagnoses Molluscorum Novæ Caledoniæ incolarum. Ibid. pp. 201-206, 329-331.
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- . Note sur les Coquilles terrestres recueillies par M. le Prof. Orton dans la région supérieure de l'Amazone, et description d'espèces nouvelles. Ibid. pp. 312-318.
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- , ———. Diagnoses molluscorum novorum, reipublicæ Mexicanæ et Guatemalæ incolarum. Ibid. xviii. p. 297.
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THE GENERAL SUBJECT.

Anatomy and Physiology.

The chief results of LEYDIG's researches concerning the auditory organs of the *Gastropoda*, made in *Helix hortensis* and *pomatia*, *Succinea amphibia*, *Paludina vivipara* and *impura* [*Biithynia tentaculata*] are:—that the channel annexed to the auditory capsule is quite different from the meatus of the *Cephalopoda*; and that the nerves originate from the superior part of the brain, although the auditory organ is situated on the lower face. "Ueber das Gehörorgan der Gasteropoden," Arch. mikr. Anat. vii. pp. 202–219, pl. 19.

FISCHER opposes Leidy's view that the groove in front of the foot is necessarily an olfactory organ, because supplied by infra-oesophageal nerves: he regards it as a reservoir of mucus, and follows most authors in attributing the olfactory function to the feelers. Fischer & Crosse, Etud. p. 81.

Particulars of the development of the spermatozooids and the act of spawning in *Sepia* and *Loligo* are given by Lafont, Act. Soc. L. Bord. xxviii. pp. 276–278.

The chief results of DUBREUIL's study of the genital apparatus of *Helix adspersa* (Müll.) are:—that in the hermaphroditic gland the follicles of the male and female organs are not interinvaginated, nor is the efferent channel of the one contained within that of the other, but is simple and common for both; the use of the flagellum is for secretion of spermatophores; and by one

copulation both individuals are mutually fecundated. Etude anatomique et histologique sur l'appareil générateur du genre *Helix*, Paris: 1871, 56 pp. 1 pl. (abstr. in J. de Conch. xix. pp. 249 & 250).

There is another paper on the same subject by JOURDAIN, in C. R. lxxiii. Oct. 1871, p. 1059, abstracted in Ann. N. H. (4) viii. pp. 442 & 443.

SPORLEDER has observed that *Helix nemoralis* and *hortensis*, after having lost their sagitta during copulation in May, develop a new one in the following September. Nachr. malak. Ges. iii. p. 17.

Oysters in Sleswig contain during winter neither sperm nor ova; in spring and summer some of them have been found with many ova, and others containing sperm, though none have been found to contain ova and sperm at the same time; it is, however, possible that the development of eggs may be followed by secretion of sperm in the same individual. MÖBIUS, *ibid.* pp. 131-134.

Striated muscular fibres have been observed in a species of *Acmaea* by DALL: Am. J. Sc. Febr. 1871, p. 123, and Am. Nat. iv. p. 691. They have already been observed by others in various genera. Q. J. Micr. Sci. (2) xi. p. 417.

Hæmoglobin is observed in the muscular fibres of the pharynx of Gastropods by RAY LANKASTER: *ibid.*

MANZONI recapitulates Semper's observations on mollusks parasitic upon *Holothuria* and *Synapta*. J. de Conch. xviii. pp. 294-296.

Helix ericetorum is observed to be active in December and January by KOBELT. Nachr. malak. Ges. iii. p. 78.

Monstrosities.

Sinistral abnormality of *Bulimus detritus*: DICKIN, *ibid.* p. 138. Scalaroid abnormalities of *Helix lapicida* and *Limnæa stagnalis*, and *Planorbis complanatus* [*marginatus*] with disjointed whorls (ceratoid): BROECK, Ann. Mal. Belg. v. pp. 33, 37, pl. 1. figs. 1-3. A similar abnormality in *Limnæa limosa* (L.): LE COMTE, *ibid.* p. lvii. Abnormal tentacles, the left being double, of *Helix lapicida*: BROECK, *ibid.* p. 24, pl. 1. fig. 4.

GEOGRAPHICAL DISTRIBUTION.

a. LAND AND FRESHWATER MOLLUSCA.

HEYNEMANN discusses the land-mollusks (especially the slugs) common to Europe and North America, in a manner somewhat too general. Nachr. malak. Ges. iii. pp. 90-92.

KOBELT's catalogue of European land and freshwater *Mollusca* enumerates 1591 species (including those of the Asiatic and African districts which belong to the same zoological province as Europe), and gives the habitat of each species and variety. The systematic arrangement of the *Helicida* is similar

to that in the 2nd edition of Albers's 'Heliceen,' though somewhat improved; the other families are arranged in an analogous manner. The species represented in the Senckenbergian Museum at Frankfort, containing the collection of the German Malacological Society, are marked with an asterisk; and there is a complete alphabetical index, comprising also the synonyms. A few critical and supplementary notes are given by the Recorder in *Nachr. malak. Ges.* iii. pp. 149-156, 167-174.

1. Northern and Central Europe.

WESTERLUND has published two nearly identical works on the Scandinavian terrestrial *Mollusca*:—one, 'Exposé critique,' published in *Trans. of the Upsala Acad.*, written in French, and, as it were, a 'prodomus' of the other (though containing full descriptions, with numerous critical remarks, and also including the freshwater species), limited to Sweden and Norway; the other, which includes also Denmark, discussing more copiously the literature and history of the individual genera (but only the first part of it, containing the land *Mollusca*, has been published). In both, the author is very minute in distinguishing species and subspecies—even proposing a new one, under the name of *Clausilia nilssoni*, for a shell never seen by him, and founded on a description given by Nilsson. The Linnæan species are made out with peculiar care, the author having examined the different localities indicated by Linnæus in his 'Fauna Suecica,' and particularly the island of Öland. He enumerates 137 species and 42 subspecies, 82 of which are terrestrial and 54 inhabitants of fresh water. From Norway, only 80 species are known; one of which, *Helix candicans*, does not appear to occur in Sweden. The province of Blekinge, in the middle part of Sweden, the home of the author, numbers 108 species; the islands of Gotland and Öland, each 77; the northern province of Dalecarlia, 81; and Lapland only 22.

Russia. Land and freshwater shells collected in middle Russia and in the Ural by Ehrenberg, during his voyage with Humboldt in 1829, are enumerated by the Recorder in *SB. Nat. Fr.* 1871, pp. 45-50: they are of well-known species, widely distributed in Europe; but it is worthy of mention that *Helix pomatia*, *nemoralis*, *hortensis*, and *arbutorum* were not found, *H. fruticum* being apparently the largest land-shell of these countries. *Amphipeplea glutinosa* lives in Lake Waldai.

The Recorder has continued his review of the literature bearing on the distribution of the German *Mollusca* (*cf.* *Zool. Rec.* vii. p. 120), now treating of the south-eastern parts of Germany included in the system of the Danube. *Nachr. malak. Ges.* iii. pp. 81-85, 97-103, 161-164, 179-185, 193-197.

STREBEL enumerates several spp. of land and freshwater shells observed by him near Hamburg: *ibid.* p. 15.

Notes concerning *Mollusca* found by Claudius in the southern parts of the

duchy of Lauenburg are given in JH. Ver. Lüneb. ii. 1866, pp. 118 & 119, and Nachr. malak. Ges. iii. p. 124.

Several land and freshwater spp. collected on the small island "Greifswalder Oie" near Rügen, and on the island of Usedom, Pomerania, are enumerated by REINHARDT, *ibid.* pp. 164-167.

New localities for *Valvata macrostoma* (Steenstr.) in Northern Germany are given by Friedel, *ibid.* p. 73.

Land-shells observed in Silesia are briefly noted by ROHRMANN, *ibid.* p. 77. 49 species of terrestrial and 20 of freshwater shells found in the mountains of Thuringia are enumerated by LAPPE, *ibid.* pp. 103-106.

Land-shells observed near Halle, and especially Mollusca found in the so-called salt lake near that town, are enumerated by REINHARDT; the latter are all well-known freshwater spp. of wide European distribution, except one species of *Hydrobia* (*vitrea*, Drap. ?); but it is not ascertained whether this lives in the lake, in which only dead shells have been found, *ibid.* pp. 2-9. In a second article, the amount of salt in the water of this lake is stated to increase from 0.168 per cent. at the surface to 0.963 per cent. at the greatest depth; and the Mollusca living in the lake are compared with those living in the Baltic, pp. 57-60.

KOBELT (Fauna der nassauischen Mollusken, 286 pp., 9 pls.) publishes a very elaborate manual of the land and freshwater Mollusca of Nassau, in which 124 Gastropods and 16 Bivalves are accurately described and figured, with many valuable remarks on habits and localities; some concluding notes as to their geographical distribution through the province (also published in Mal. Bl. xviii. pp. 200-212) prove that the mountain-region is here much poorer in species, and generally also in individuals, than the plain. As the German species not yet found in Nassau are also mentioned and shortly characterized, this book forms a very useful manual of German conchology.

SANDBERGER gives some supplementary observations on this work, with notes concerning the environs of Brückenau, which, being on a new red sandstone formation, is very poor in Mollusca. Nachr. malak. Ges. iii. p. 200.

Alsace and Lorraine. MORLET (J. de Conch. xix. pp. 34-39) publishes a list of 145 species observed by him near New Breisach, Colmar, and Belfort. Most of these species occur also on the other side of the Rhine, in Baden, Württemberg, and Nassau; but near Belfort certain spp. of a more southern character are found, such as *Hyalina hydatina*, *Unio requieni*, &c.: Martens, SB. Nat. Fr. 1871, pp. 98 & 99 (where also are some notes respecting our knowledge of the Mollusca of Lorraine).

Bavaria. 113 spp. of Mollusca found near Augsburg are recorded by CLESSIN, with various interesting notes concerning their topographical distribution. The spp. described and figured in 1812 by Von Alten from this district are carefully reviewed. Ber. Ver. Augsb. xxi. pp. 83-126. The same author also treats of 14 species of *Clausilia*, occurring in S. Bavaria, Nachr. malak. Ges. iii. pp. 134-137. Several Mollusca observed near Walchensee, S. Bavaria, between 2000 and 5000 feet, by Reinhardt, are enumerated, *ibid.* p. 186.

Württemberg. LEXDIG (JH. Ver. Württ. 1871, p. 240) notes the occurrence

of rare or local species of mollusks in this kingdom, as well as in some parts of Bavaria and the Tyrol; he also states the result of experiments as to the numerical proportions of small shells deposited on banks of rivers.

Switzerland. *Helix pulchella* is found on Mt. St. Bernard at an elevation of 9500 ft., and *Vitrina pellucida* on the Riffelberg at 9000 ft., by ROFFIAEN, Ann. Mal. Belg. v. pp. xvii & xviii. A list of 16 spp. found in Switzerland is given by CRAVEN, *ibid.* pp. lii-liv.

Belgium. Accounts of land and freshwater Mollusca found in various Belgian localities are to be found nearly on every page of the Annals of the Malacological Society of Belgium. *Bulinus astierianus* (Dupuy) has been found at Namur (p. 45), and *Physa acuta* (Drap.) in different localities (pp. 19, 25, and xvii). *H. aspersa* (Müll.) appears to be limited to small areas, where it lives in considerable numbers, near human habitations, but never in deserted mountainous regions (p. 20).

2. Southern Europe.

Croatia. MÖLLENDORF (Nachr. malak. Ges. iii. 1871, pp. 20-29, 40-43, 62-64) compares and translates rather fully Brusina's publications on the malacological fauna of this province (*cf.* Zool. Rec. vii. p. 108), which appears to contain 124 terrestrial and 45 freshwater spp.

Slavonia. Several notes concerning the land and freshwater shells of this country are given by the same author, *ibid.* pp. 61 & 62.

Bosnia. The same author publishes his personal observations on the malacological fauna of Bosnia, with a list of 46 spp., including a new *Campylæa*, *ibid.* pp. 65-73.

KÜSTER, in the commencement of an account of the land and freshwater Mollusca of Trieste and Dalmatia, discusses *Bulinus*, *Cionella*, and *Pupa*. Ber. Ges. Bamb. ix. pp. 91-94.

Lombardy. A list of the known species of land and freshwater Mollusca of Lombardy, with synonyms and a few critical remarks, is given by A. & G. B. Villa, Bull. Malac. iv. pp. 81-96.

Pyrenees. 25 species found in the vicinity of Ax (Ariège) are enumerated, and the habits of some of them noted, by NOULET in 'Mollusques d'environns d'Ax' (extr. in J. de Conch. xviii. p. 370).

HIDALGO's 'Hojas Malacologicas' contain various lists written partly by himself, partly by ZAPATER and MACHO, of terrestrial Mollusca collected in Murcia, Valencia, Galicia, Old Castile, and Portugal (pp. 5-32); also an alphabetical list of conchological authors, with a special account of the slugs and land-shells mentioned by them as occurring in Spain or Portugal, pp. 81-184 (not yet finished), by the author.

Azores. TRISTRAM's account of the mollusks adds no new species to those published in 1860 by Morelet, though confirming some of the latter.

3. Western Asia.

Siberia. The Recorder has given a list of land and freshwater shells collected by Ehrenberg during his voyage to Siberia and the Altai with Humboldt in 1829. Those of the eastern slope of the Ural and the plains of Siberia are European; in the large rivers of western Siberia no *Unio* has been found;

in the Altai, on the borders of Chinese Dzungaria, some new species of land-shells make their appearance, *e. g.* *Helix bicallosa* (Friw.) and a new *Succinea*. SB. Nat. Fr. 1871, pp. 45-50.

Samarcand. The 4 spp. mentioned in Zool. Rec. vii. p. 124, are described and figured by the Recorder in Mal. Bl. xviii. pp. 61-68, pl. 1.

Transcaucasia. Some spp. nn., including a *Cyclotus*, are described by Pfeiffer, *ibid.* pp. 69, 70.

Palestine. 21 spp. of land and freshwater shells found by Kiepert, chiefly near and beyond the Jordan, are enumerated and partly described, with some critical remarks, by the Recorder, *ibid.* pp. 53-61, pl. 1.

4. Southern Asia.

Thibet. Shells collected by David in Moupin, E. Thibet (18 of which are regarded as new), are described by Deshayes in N. Arch. Mus.

Province of Tenasserim. Stoliczka has published a very interesting account of the terrestrial Mollusca of the environs of Moulmein, describing many spp. nn., and elucidating the synonymy and systematic position of others in various essential points, especially by his anatomical researches. It contains 4 *Cyclophoridae*, 3 *Pupinidae*, 3 *Diplommatinidae*, 2 *Helicinidae* (*Georissa*), 8 *Streptaxidae*, 2 *Pupidae*, 1 *Clausilia*, 4 *Helicidae* (*Plectopylis* and *Trachia*), and 12 *Zonitidae*, among which are 4 of the peculiar genus *Sophina*. J. A. S. B. xl. pp. 143-177 and 217-259.

Ceylon. 179 spp. of land-shells (118 *Helicidae* and 61 *Operculata*) are enumerated in Nevill's "Enumeratio Heliceorum et Pneumonopomorum."

5. Polynesia.

627 spp. of Polynesian land-shells (120 *Operculata*, 25 *Auriculidae*, and 482 *Helicidae*, including 223 spp. of *Achatinella*) are enumerated by PEASE, P. Z. S. 1871, pp. 471-477, and the habitats of several of them, hitherto unknown or wrongly given, ascertained or corrected.

The "Faune conchyliologique terrestre et fluvio-lacustre de la Nouvelle Calédonie," of GASSIES, in Act. Soc. L. Bord. xxviii., is a new and much augmented edition of the author's former publication (1863). It now contains 302 spp., viz. 4 slugs, 116 inoperculated and 19 operculated land-shells, 57 submarine shells (*Auriculidae*, *Truncatella*, and the so-called *Hydrocena*), 1 *Ampullaria*, 16 *Limnæidae*, 34 *Melaniidae*, 49 *Neritidae*, and 4 *Cyrenidae*; among them, the numerous spp. of *Bulimus*, group *Placostylus*, the presence of *Melanopsis* (20 spp.), the absence of *Limnæa*, while *Physa* is represented by 9 spp., the number of *Neritine* and *Auriculidae*, &c. are remarkable points. All spp. not mentioned in the former edition are provided with a Latin diagnosis and French description; but, as most of them have been published in the last volumes of J. de Conch., few (entirely new) will be mentioned in the special part of this Record.

Tonga Islands. The land and freshwater shells are treated, from the collections of Gräffe, by Mousson, who enumerates 19 *Helicidae*, 5 *Helicinidae*, 13 spp. of *Omphalotropis*, (so-called) *Hydrocena*, and *Truncatella*, 2 of *Physa* (the only genus of *Limnæidae* represented), 6 *Auriculidae*, and 5 of *Melania*;

in all 50, of which about 37 are terrestrial, 7 belong to the fresh water, and 6 or more to brackish water. J. de Conch. xix. pp. 1-33.

Annaa Island. 15 terrestrial Mollusca are enumerated by PEASE (*ibid.* p. 92), including 6 spp. of *Melampus*, and some others which are rather inhabitants of brackish water, but only 3 *Helicidae*. The existence of *Partula* on this island is denied.

6. Tropical America.

CROSSE and FISCHER have commenced a special account of the land and freshwater Mollusca of Mexico and Central America (chiefly Guatemala), founded principally on materials collected by Boucard and Bocourt. In the introduction they give a detailed list of naturalists who have collected Mollusca in these countries, the fauna of which they consider to be that of N. America invaded by S. American forms. The text (so far as the Recorder has seen it) comprises *Strebelia*, *Streptostyla*, *Petenia*, *Glandina*, and *Zonites*, all spp. of which recorded from these countries are named, with full accounts of literature; many new species are described and figured, and very valuable anatomical accounts given.

The physical geography of the West-India Islands, in connexion with the distribution of the terrestrial *Mollusca*, is the object of a very interesting paper by BLAND: the islands from Trinidad to St. Lucia inclusive, connected by a submerged ridge, appear to have spp. nearly allied to those of S. America; while the fauna of the islands on the northern side of the Caribbean Sea, from Cuba to the Virgin and Anguilla banks, is derived from Mexico and Central America. P. Am. Phil. Soc. 1871, pp. 56-63.

64 spp. of land-shells from the valley of Quito are enumerated, and their geographical relations described, by BLAND, Am. Nat. v. pp. 696-698.

28 spp. of land-shells (some new) collected by ORTON in the upper region of the R. Amazon are enumerated by CROSSE in J. de Conch. xix. pp. 312-318.

7. North America.

COOPER continues his critical remarks concerning the land-snails of the W. coast of N. America, chiefly discussing *Vitrina* and *Helix* (*Lysinoe*, *Arionta*, *Mesomphix*), with reference to their geographical distribution. Am. J. Conch. v. pp. 199-219.

ALCOTT has found *Melania virginica* and *carinata* in Massachusetts. Am. Nat. iv. p. 250.

VERRILL enumerates 10 spp. of freshwater shells found in Lake Superior. Am. J. Sc. (3) ii. pp. 448 & 449.

b. MARINE MOLLUSCA.

1. European Seas.

MANZONI gives a very short account of recent deep-sea explorations. Bull. Malac. iv. pp. 108-110.

MÖRCH enumerates 233 spp. of marine Mollusca (160 Gastropods and 93 Bivalves), from the coasts of Denmark, with numerous localities for most of

them. The introduction gives a careful account of authors who have contributed to the knowledge of the Danish sea Mollusca, and of dredgings made in these seas by various naturalists. Vid. Medd. 1871, pp. 157-225.

Several shells of the Baltic (including *Litorina litorea*) are mentioned as found during an excursion to the inlet of Wismar by STRUCK, Arch. Ver. Mecklenb. xxiv. pp. 69-71.

Astarte arctica (Gray) is recorded by WIECHMANN (*ibid.* p. 71) as again found near Warnemünde.

BERGH gives a list of 62 spp. (29 Bivalves and 33 Gastropods) collected on the banks of the Kattegat and Skagerack, at depths of 10-30 fathoms, and of 13 spp. found on the Skag-bank, on the western side of Jutland, in 8-11 fathoms. Among them 11 belong to the arctic, 31 to the boreal, and 18 to the Lusitanian fauna. Act. Lund. vii. pp. 13-23, 28-36.

33 marine Gastropods and 19 Bivalves, collected during an excursion of the Belgian Malacological Society at Heyst, are enumerated by MOURLON, Ann. Mal. Belg. v. pp. 69-73.

84 spp. observed at St. Malo and Roscoff, in Northern France, are enumerated by GRUBE, JB. schles. Ges. pp. 61-63.

TASLÉ publishes a supplement to his (1868) list of Mollusca of Western France (*cf.* Zool. Rec. vi. pp. 519 and 528), adding many spp., chiefly *Nudibranchiata*.

FISCHER's supplement to his marine conchological fauna of the Gironde (1865) brings the number of spp. from 177 to 347, including those observed at Rochelle, many of which are due to the researches of Lafont at Arcachon, and to the dredgings of De Folin. Six-sevenths of the spp. are common to England and the Mediterranean; 17 boreal, not ranging further south than Cape Finisterre, in Portugal; and 31 meridional, not ranging further north than Cape Finisterre, in Brittany. *Ostrea cochlear* (Poli) and *Diphyllidia pustulosa* (Schultz) are here recorded as new to the Atlantic coasts of Europe. In the introduction, the currents, depths, banks, and accumulations of shells, near or on the coast, are briefly mentioned. Act. Soc. L. Bord. xvii. pp. 71-132.

4 spp. of Bivalves, 9 Nudibranchiata, 18 of mostly minute shell-bearing marine Gastropods, and as many Cephalopods, observed at Arcachon (several new) are enumerated by LAFONT, *ibid.* xxviii. pp. 266-278.

The list of the recent fauna of the South-European seas has been enriched by various spp. hitherto known only in a fossil state (e. g. *Trochus filiosus*, *T. suturalis*, and *Pleurotoma hispida*), or from Norway or North America, and several quite new, through the deep-sea researches of CARPENTER and JEFFREYS. P. R. Soc. 1870, no. 125; Nachr. malak. Ges. iii. pp. 86-90.

HIDALGO has published three more parts of his "Molluscos marinos de España," &c., the second and third of which contain (according to Crosse, J. de Conch. xix. p. 153) the Bivalve genera *Lutraria*, *Eastonia*, *Callista*, *Dosinia*, and *Caryatis*, and some *Bullidæ*; the fourth is said to be a monograph of the genus *Fasciolaria*.

93 spp. of sea-shells, collected on the Mediterranean shore of Egypt, near Ramleh, are enumerated by SCHNEIDER, SB. Ges. Isis, 1871, pp. 116-121.

2. Tropical Atlantic.

Mollusks living in the Atlantic gulf-weed (9 *Nudibranchiata* and *Cyclobranchiata*, some new) are accurately described, and most of them figured, by BERGH, Verh. z.-b. Wien, xxi. pp. 1273-1308, pls. 11-13.

Florida. 314 spp. of marine shells are enumerated by STIMPSON, of which 58 are peculiar to the east and 111 to the west coast, 145 being common to both. Am. Nat. iv. pp. 566 & 567.

West Africa. 92 spp. (many new), collected by Knockers at Wydah, are enumerated by SMITH, P. Z. S. 1871, pp. 727-739, pl. 75.

3. Red Sea.

MANZONI publishes a few words concerning the difference of the fauna from that of the Mediterranean Sea. Bull. Malac. iv. pp. 107 & 108.

61 species of sea-shells collected at Suez, not one of which has yet been recorded from the Mediterranean, are enumerated by MALTZAN, Nachr. malak. Ges. iii. pp. 202 & 203.

KLUNZINGER gives an interesting account of the use of Mollusca for food or ornament &c., in Z. Ges. Erdk. vi. pp. 69-71. FISCHER enumerates Red-Sea spp. mentioned by Issel, MacAndrew, and others, and not included in his former paper on the same subject, adding some new ones. J. de Conch. xix. pp. 209-219.

4. Pacific.

LISCHKE has published a 2nd volume of his valuable work on the marine mollusks of Japan, based on new materials received from v. Schrenck, Böddinghaus, Birileff, and others. He adds many spp., giving new descriptions and many beautiful figures, and is very precise as to geographical distribution. From his work, it would appear that some spp. (e. g. *Tritonium olearium*, *Lasæa rubra*, *Crepidula aculeata*) occur in the greater part of the world, whilst others are common only either in the Indian seas or on the N.W. coast of America—and that there are two distinct faunæ in Japan, one southern or Indian, the other northern and common to both shores of the Pacific. 327 Japanese spp. are recorded in the two vols.; and of them 100 are only known from Kiusiu (Nagasaki), Nippon (Bay of Yeddo), and Yesso, 24 from Sachalin and the continental coast of Mantchouria, or Corea, 150 from China or the Philippines, 128 from other parts of the Indian seas (including the east coast of Africa), 48 from Australia, 20 from New Zealand, 16 from the W. coast of Africa, 5 from the Mediterranean, 6 from the Atlantic shores of Europe, 3 from the Atlantic shores of N. America, 13 from the W. Indies or Brazil, 24 from the W. coast of N. America, 8 from Behring's sea, and 3 (*Saxicava arctica*, *Mya arenaria*, *Modiola modiolus*) circumpolar.

A collection of 305 spp. of South-Sea shells, mostly marine, sent by a German merchant from Honolulu to Prince v. Bismarck, 1871. [VOL. VIII.]

and given by him to the Frederick-Werder Gymnasium, Berlin, has been described by LANGKAVEL, with the assistance of the Recorder, in a prospectus of that institution (published also separately, with several additions, under the title "Donum Bismarckianum"). Almost all the spp. have been already named and shortly described by Pease; but many are here figured for the first time. A few critical remarks are added by the Recorder; and a geographical review of the individual islands in which the spp. occur is subjoined by Langkavel.

21 spp., wrongly attributed by recent conchologists to the fauna of New Caledonia, are enumerated by CROSSE, J. de Conch. xix. pp. 170-187.

109 spp. of marine shells, resulting from Brazier's dredgings, are added to the known fauna of Port Jackson by ANGAS, P. Z. S. 1871, pp. 87-101; and the spp. mn. are described and figured, *ibid.* pp. 13-21, pl. 1.

Contemporaneous Changes of Fauna.

Helix austriaca, acclimatized 17 years ago near Stettin, thrives there very well and multiplies considerably. *H. advena* is recorded as having lived for 4 years in confinement, moving about during damp weather or when fresh food was supplied, also after having shut up its orifice completely. DORN, Nachr. malak. Ges. iii. pp. 17 & 18.

Helix obvia (Hartm.) is noticed as being acclimatized in several localities near Berlin. FRIEDEL, *ibid.* pp. 74 & 75.

KOBELT refers to instances of various spp. of terrestrial Mollusca becoming very rare in localities where they were formerly plentiful, partly after unusually dry years, partly on account of changes in the culture of the soil. *Ibid.* pp. 9-14.

Littorina littorea (L.) spreads on various points of the shores of the United States. FULLER, Am. Nat. iv. p. 250.

Paleontology of Recent Species.

Various localities in which recent species have been found on the Danish coasts in somewhat elevated spots, and many of which were probably due to former inhabitants, are collected from local authors by MÖRCH, Vid. Medd. 1871, pp. 171 & 172.

The occurrence of several recent spp. in diluvial strata of Germany is mentioned by TISCHBEIN (Nachr. malak. Ges. iii. p. 54) and FRIEDEL (*ibid.* pp. 73 & 74).

Cyclostoma elegans (Müll.) is recorded by Broeck (Ann. Mal. Belg. v. p. 28) as found with other recent freshwater spp. in a subfossil stratum below the polder-clay and above old turf strata in the province of Antwerp, where it has never been found alive.

Large accumulations of shells identical with recent spp. have been observed in the department of the Gironde. They are attributed to a geological elevation of the coast by DELFORTUE, but are of later age than the beds in which bones worked by man and stone instruments are found. Act. Soc. L. Bord. xxvii. pp. 23-28.

Several spp. living at present on the shores of New England are identified with crag-fossils by BELL, Ann. N. H. (4) vii. p. 173.

WYMAN'S paper on kitchen-middens in Maine and Massachusetts, containing common marine shells and *Zua lubricoides* (Am. Nat. i. p. 561), and another by the same author on the freshwater-shell heaps of the St. John's River, East Florida, composed of *Ampullaria depressa*, *Paludina multilineata*, and *Unio buckleyi* (*ibid.* ii. pp. 393 and 449), may be mentioned here (though so long after date) on account of their interesting contents.

Use by Man.

Several shells now or formerly used as money or ornaments by the American aborigines are mentioned by STEARNS, viz. *Venus mercenaria*, *Dentalium pretiosum*, *Saxidomus gracilis* (?), *Haliotis rufescens* and *cracherodii*. *Ibid.* iii. pp. 1 and 250-256.

The fishery of oysters and various other shells at Naples is described by COSTA, Atti Ist. Nap. (2) vii. pp. 78-83.

A short account of the fisheries in the Red Sea, and the trade in pearl-oysters, is given by KLUNZINGER in Z. Ges. Erdk. vi. pp. 70 & 71.

Some account of terrestrial Mollusca eaten by man in Spain, and of their local names, is to be found in the lists of Spanish land-shells by HIDALGO and ZAPATER, Hojas malacologicas, pp. 23, 28, 29.

Classification.

GILL arranges the *Mollusca* in 27 orders and no less than 356 families. Smiths. Collect. 1871.

MÖRCH has continued his review of the older conchological nomenclature, enumerating in chronological order the genera proposed or adopted by different conchologists at and immediately after the Linnæan period, from 1767-1811, with interesting bibliographical and biographical notes. Mal. Bl. xviii. pp. 16-38.

He also gives the synonymy of spp. described by Menke as new in his catalogue of the collection of the Baron von Malsburg, 1828. *Ibid.* pp. 125-127.

CEPHALOPODA.

For critical remarks on the pretended name *Sepia biserialis* (Montfort), which is due to a misunderstanding, and two probably exotic shells of a *Sepia* found on the coast of France, cf. FISCHER, Act. Soc. L. Bord. xxvii. p. 126.

Spawning and spermatozooids of *Sepia* and *Loligo*, see above, p. 121.

Loligo vulgaris (Lam.), in the restricted sense given by Steenstrup, occurs on the Atlantic coast of France, where *L. forbesi* (Steens.) is common. *L. pulchra* (Blainv.), also found at Arcachon, is distinct from both, and probably identical with *L. bertheloti* (Verany). Fischer, l. c. p. 128.

Loligo affinis, *microcephala*, and *macrophthalma*, spp. nn., Lafont, *ibid.* xxviii. pp. 273 & 274, pls. 13, 14, 15, Arcachon. The author enumerates 7 species of this genus occurring at that place, giving their differences, and proposing the name *moulinsi* for *vulgaris*, Férussac (Cephalop. pl. 8), nec Lamarck.

Ommastrephes crassus, sp. n., *id.* l. c. p. 275, pl. 16, Arcachon.

Eggs of a Cephalopod (genus not determined), forming a web-like mass, 2 feet in length, have been observed by Collingwood. P. L. S. xi. pp. 90-94, pl. 1.

PTEROPODA.

The nervous system of *Creseis acicula*, consisting of four dorsal and four abdominal ganglia, is described by STUART, Z. wiss. Zool. xxi. pp. 317-324, pl. 24 A.

HETEROPODA.

Fvrola. The mouth is furnished with two longitudinal rows of slightly curved teeth. Macdonald, Q. J. Micr. Sci. (2) xi. p. 274.

Recluzia montrouzieri, sp. n., Souverbie, J. de Conch. xix. p. 334, Art Island, New Caledonia.

GASTROPODA.

PECTINIBRANCHIATA.

PROBOSCIDIFERA RHACHIGLOSSA.

MURICIDÆ.

Murex emarginatus (Sow.) and *japonicus* (Dunker), from Japan, Lischke, Jap. Meeres-Conch. ii. pp. 30 & 31. *M. aciculatus* (Lam.) = *corallinus* (Scacchi), Fischer, Act. Soc. L. Bord. xxvii. p. 124. *M. hidalgoi* (Crosse, 1869), J. de Conch. xix. p. 68, pl. 1. fig. 6, West Indies.

Murex lamelliferus, sp. n., Dunker, Mal. Bl. xviii. p. 158, Formosa.

Trophon petterdi, sp. n., Brazier, J. de Conch. xviii. p. 303, xix. p. 324, pl. 12. fig. 2, Tasmania; *T. birileffi*, sp. n., Lischke, Mal. Bl. xviii. p. 39, and Jap. Meeres-Conch. ii. p. 32, Nagasaki.

PURPURIDÆ.

Purpura tumulosa (Reeve) is the young state of *clavigera* (Küst.), Lischke, Jap. Meeres-Conch. ii. p. 29; *P. freycineti* (Desh.?, Reeve?, Midd.), from Japan, is compared with allied spp., *id. ibid.* pp. 40-43, pl. 4. figs. 15-19.

Purpura porphyroleuca, sp. n., Crosse, J. de Conch. xviii. p. 302, xix. p. 322, pl. 13. fig. 7, Tahiti.

P. (Polytropa) exilis, sp. n., Dunker, Mal. Bl. xviii. p. 154, Upolu.

P. (Sistrum) fusconigra, sp. n., *id. ibid.*, Kingsmill Islands.

P. (Sistrum) elata (Blainv.) = *Ricinula spectrum* (Reeve); *atromarginata* (Blainv.) = *Sistrum affine* (Pease), both from Kingsmill Islands: Martens & Langkavel, Don. Bism. p. 10.

Iopas sertum (Brug.). Only the form with smooth striæ is known from E. Africa, *iid. l. c.* p. 9.

Vexilla (Usilla) fusconigra (Pease), *iid. ibid.* pl. 1. fig. 8, Sandwich Islands.

Ricinula undata (Murex, Chemn.) = *margariticola* (Brod.) = *fiscellum* (Kien., Reeve, nec Chemn.), Lischke, Jap. Meeres-Conch. ii. p. 44, China and Japan.

Engina monilifera and *fusiformis* (Pease), Martens & Langkavel, *l. c.* pp. 22 & 23, pl. 1. figs. 15 & 16, Sandwich Islands and Central Pacific; *variabilis* and *nodicostata* (Pease), *iid. ibid.*

Leptoconchus robillardii, sp. n., Liénard, J. de Conch. xviii. p. 305, xix. p. 73, pl. 1. fig. 5, Mauritius; *L. schrenckii*, sp. n., Lischke, Mal. Bl. xviii. p. 40, and Jap. Meeres-Conch. ii. p. 45, pl. 4. figs. 9 & 10, Nagasaki.

BUCCINIDÆ.

[*Buccinum*] *Tritonium undatum* (L.), var. *paupercula*, only 50 millims. long, is recorded from the coasts of Denmark by Mörch, Vid. Medd. 1871, p. 196.

Fusus jeffreysianus (Fischer, J. de Conch. xvi.) is common on S.W. coast of France, from Spain to the mouth of the Loire, and is distinct from the African *F. buccinatus* (Lam.); a specimen of *F. berniciensis* (King) has been dredged at Port Louis (départ. Morbihan), and another found on the beach at the Garonne: Fischer, Act. Soc. L. Bord. xxvii. p. 123.

Fusus inconstans (Lischke), on its variability, cf. Lischke, Jap. Meeres-Conch. ii. p. 26, pl. 3. figs. 1-5; *F. nodosoplicatus* (Dunker) var., *id. ibid.* fig. 6; *F. tuberosus* (Reeve) from Nagasaki, *id. ibid.* p. 27.

Fusus meyeri and *rudolphi*, spp. nn., Dunker, Novitat. Conch. pp. 127 & 128, pl. 43. figs. 1, 2, and 3, 4, localities unknown.

Siphonalia cassidariæformis (Reeve): on some supposed varieties of this sp., cf. Lischke, *l. c.* p. 28.

Pollia contracta (Reeve) and *menkeana* (Dunker), *id. ibid.* p. 50, Nagasaki.

Pisania fumosa (Dillw.) = *Triton plicosum* (Menke, 1829) = *Buccinum rubiginosum* and *B. proteus* (Reeve), widely distributed in the Indian and Pacific seas; *P. ignea* (Gmel.) = *Bucc. pictum* (Reeve), with remarks on its synonymy. Martens & Langkavel, *l. c.* p. 5.

Tritonidea aspera and *T. (Cantharus) samoensis*, spp. nn., Dunker, Mal. Bl. xviii. p. 155, Samoa Islands.

Nassaria farinosa (Gould), Martens & Langkavel, *l. c.* pl. 1. fig. 7, Sandwich Islands.

Nassaria magnifica, sp. n., Lischke, Mal. Bl. xviii. p. 148, and Jap. Meeres-Conch. ii. p. 38, pl. 6. figs. 11 & 12, island Kiusiu, Japan.

NASSIDÆ.

Nassa reticulata (L.), Mörch, Vid. Medd. 1871, p. 197, distinguishes as varieties, from the Danish coasts:—1. *cancellata* (Chemn.); 2. *paucicostata* = *N. nitida* (Jeffr.); 3. *paupercula*, with thick epidermis. *N. trifasciata* (A. Adams, P. Z. S. 1851) = *gallandiana* (Fischer, J. de Conch. x. and xi.), probably identical with the fossil *semistriata* (Brocchi) and allied by intermediate forms to *N. corniculum* (Oliv), has been dredged alive off Arcachon: *N. nitida* (Jeffr.) is a local variety of *reticulata* (L.), the former living within, the latter without, the "bassin d'Arcachon": Fischer, Act. Soc. L. Bord. xxvii. p. 122 & 123. *N. livescens* (Phil.), *gracilis* (Pease), and *fratereuhus*, var., from Japan; Lischke, Jap. Meeres-Conch. ii. pp. 52-54, pl. 4. figs. 1-3, 4-6, and 7, 8; *N. balteata* (Lischke, nec Pease) and *N. festiva* (Powis) = *lirata* (Dunker), *id. ibid.* pp. 51, 53. *N. approximata* (Pease) ? = *olivacea* (Brug.), var.; *margaritifera* (Dunker), *concinna* (Powis), *albescens* (Dkr.) = *bicolor* (Hombr. et Jacq.), *ravida* (A. Ad.), *curta* (Gould), *gaudiosa* (Hinds) = *punctata* (A. Ad.), Polynesian Islands: for critical remarks about these spp., cf. Martens & Langkavel, *l. c.* pp. 6-9. *N. gibbosula* (L.) lives in the Mediterranean, and not in the Red Sea: Fischer, J. de Conch. xix. p. 225. *N. onerata* (Desh.) = *obliqua* (Hombr. et Jacq.), Pease, *ibid.* p. 102.

Nassa (Desmoulea) tryoni (Crosse, 1869), J. de Conch. xix. p. 70, pl. 1. fig. 7, locality unknown.

Nassa pumilio, sp. n., Smith, P. Z. S. 1871, p. 732, pl. 75. fig. 11, Wydah.

Cyclonassa unifasciata (Nanina *id.*, Risso, 1826) = *italica* (Issel): Paulucci, Bull. Malac. iv. pp. 23-25.

OLIVIDÆ.

Oliva. MARRATT concludes his monograph of this genus in Sowerby's 'Thesaurus' (pt. xxx. pp. 1-46, pls. 15-25), containing 226 spp., and illustrated by 475 good figures.

The following spp. are described as new, the localities of many of them being unknown :—

O. artata, China sea, figs. 229 & 230; *blanda*, figs. 236 & 237; *faba*, figs. 238 & 239; *reclusa*, Florida, fig. 246; *mercatoria*, W. Indies, figs. 268 & 269; *mucronata*, figs. 274 & 275; *nivosa*, fig. 276; *circinata*, fig. 277; *ovata*, figs. 281 & 282; *labuanensis*, Labuan, figs. 311 & 312; *annotata*, Sierra Leone, figs. 313-315; *cauta*, W. Africa, figs. 327-329; *læve* [sic], W. Africa, figs. 330 & 331; *intricata*, Africa, figs. 344 & 345; *affinis*, Acapulco, fig. 352; *pusilla*, Florida, fig. 360; *lactea*, Edgemont Bay, fig. 376; *versicolor*, Gulf of California, figs. 377 & 378; *scurra*, W. Indies, fig. 380; *tenuis*, fig. 385; *elongata*, figs. 386 & 387; *alba*, Guatemala, fig. 390; *piperita*, figs. 402 & 403; *pulla*, fig. 411; *fabula*, figs. 420 & 421; *nota*, Vancouver's I., fig. 428; *pulchra*, fig. 429; *compta*, California, fig. 432; *volutelloides*, fig. 435; *miliacea*, Alexandria [P], fig. 441; *lutea*, figs. 444 & 445; *bullata*, fig. 448; *exilis*, fig. 452; *orbigny* [*auricularia* (Orb.), var.], Patagonia, fig. 458; *plana*, fig. 463; *pulicaria*, fig. 464; *micula*, Alexandria [P], fig. 468; *grata*, fig. 470; *fulca*, fig. 471.

Oliva (*Olivella*) *consobrina*, sp. n., Lischke, Mal. Bl. xviii. p. 41, and Jap. Meeres-Conch. ii. p. 62, pl. 5. figs. 10 & 11, Nagasaki.

Olivella exquisita, sp. n., Angas, P. Z. S. 1871, p. 13, pl. 1. fig. 2, N. S. Wales.

TURBINELLIDÆ.

Turbinella scabra (Souverbie, 1869), J. de Conch. xviii. p. 430, pl. 14. fig. 3; and *T. noumeensis* (Crosse, 1870), *ibid.* xix. p. 199, pl. 6. fig. 1, N. Caledonia.

FASCIOLARIIDÆ.

Fasciolaria is said to be monographed in Hidalgo's 'Moluscos marinos de España,' part iv., 1871 (63 pp. with 4 pls.), which, to the Recorder's regret, has not come within his reach.

Fasciolaria audouini (Jonas), Lischke, Jap. Meeres-Conch. ii. p. 28, Japan. *F. (Polygona) crocea* (Gray) = *Latirus newcombii* (A. Ad.), Sandwich Islands, Martens and Langkavel, Don. Bism. p. 12, pl. 1. fig. 9; *F. (P.)* sp. —, ? = *ustulata*, Rv., described, *ibid.* *F. (Turbinella) rhodostoma* (Dunker), Lischke, l. c. p. 29, Nagasaki.

VOLUTIDÆ.

CROSSE (J. de Conch. xix. pp. 263-309) gives a list of the 73 known recent species of *Voluta* (excluding *Lyria*), arranging them in 16 sections, 6 of which are each composed of a single species, and most of which have been previously established by or are slightly modified from Swainson, Gray, and H. and A. Adams, the following being new :—

Psephæa, for *Voluta concinna* (Brod.), pl. 12. fig. 7, Japan; *Volutoconus*, for *V. coniformis* (Cox) [see next page]; *Mamillana*, for *V. mamilla* (Gray).

The headquarters of *Voluta*, as restricted by Crosse, appear to be in Australia, and a triangle from Ceylon to Japan and New Zealand would include three fourths of the species; the Indian

seas contain various spp.; and several others occur on the different shores of Africa and S. America, the Arctic and European seas and the Red Sea, however, having no representative of them.

Voluta rupestris, var. *hamillei*, Crosse, Lischke, Jap. Meeres-Conch. ii. p. 59, Japan.

Voluta punctata (Swains.) figured from a fine specimen by Cox, J. de Conch. xix. p. 77, pl. 5. fig. 2; *V. coniformis*, Bass's Straits, and *kingi*, N.W. Australia, spp. nn., *id. ibid.* pp. 74-76, pl. 4. figs. 1 & 2, also P. Z. S. 1871, p. 324, pl. 34. figs. 4, 5, & 6.

V. (Aulica) wisemani, sp. n., Brazier, J. de Conch. xix. p. 78, pl. 5. fig. 1, N.E. Australia.

V. (Amoria) australiæ, sp. n., Cox, P. Z. S. 1871, p. 643, pl. 34. fig. 6, Bass's Straits.

MITRIDÆ.

Mitra kraussii (Dunker) = *microzonias* (Schrenk, nec Lam.), Lischke, Jap. Meeres-Conch. ii. p. 60, Japan.

Mitra carinilirata, sp. n., Souverbie, J. de Conch. xix. p. 335, Art Island, N. Caledonia.

M. (Turricula) elegantula, sp. n., Dunker, Mal. Bl. xviii. p. 154, Upolu.

M. (T.) bella (Pease), *picea* (Pease), and *todilla* (Migh.), Martens & Langkavel, Don. Bism. pp. 17 and 19, pl. 1. figs. 10-12, Sandwich Islands; *cf. ibid.* pp. 16 & 17 on colours of *rubra* and *rosea* (Brod.).

M. (Strigatella) acuminata (Swains.) and *columbellaformis* (Kien.); for critical remarks on these spp., *cf.* Martens & Langkavel, *l. c.* pp. 13 & 16; *brunnea* (Pease) described, *ibid.* p. 15, Baker Island; *samuelis* (Dohrn) is distinct from *stricta* (Reeve), *ibid.* p. 18.

Dibaphus philippii (Crosse) occurs on the Caroline Islands: Pease, J. de Conch. xix. p. 98.

COLUMBELLIDÆ.

Columbella varians (Sow.) and *nana* (Mich.) = *pæcila* (Sow.), as to variability of which *cf.* Martens & Langkavel, *l. c.* p. 21; *C. marquesa* (Gaskoin) queried as a *Daphnella*, *ibid.* p. 22; *C. fusiformis* (Pease), *ibid.* p. 21, pl. 1. fig. 14, Sandwich Islands.

Columbella martensi, sp. n., Lischke, Mal. Bl. xviii. p. 40, and Jap. Meeres-Conch. ii. p. 47, pl. 5. figs. 1-9, Nagasaki.

C. (Seminella) varia (Pease) is renamed *peasei*, *varia* being preoccupied; *C. (S.) lacryma* (Gaskoin), Martens & Langkavel, *l. c.* p. 23, pl. 1. figs. 17 & 18, Sandwich I.

C. (Nitidella) vitensis and *plicatula*, spp. nn., Dunker, Mal. Bl. xviii. pp. 156-158, and *C. (Anachis) nana* and *pusiola*, spp. nn., *id. ibid.* p. 157, Fiji I.

C. (Mitrella) bicincta and *attenuata*, spp. nn., Angas, P. Z. S. 1871, p. 14, pl. 1. figs. 3 & 4, Port Jackson.

Amycla (Astyris) stratula and *tesselata*, spp. nn., Dunker, *l. c.* pp. 155 & 156, Fiji and Paumotu I. *A. (Ast.) varians* (Dunker), Lischke, Jap. Meeres-Conch. ii. p. 49, Nagasaki.

MARGINELLIDÆ.

Marginella keenii, Marratt, Ann. N. II. (4) vii. p. 141, S. Africa; *lifouana*,

Crosse, J. de Conch. xix. p. 205, Lifou Island, New Caledonia; *angasi*, Brazier, *ibid.* xviii. p. 304, xix. p. 324, pl. 12. fig. 3, Pt. Jackson; *ochracea*, Angas, P. Z. S. 1871, p. 14, pl. 1. fig. 6, N. S. Wales: spp. nn.

Marginella peasei (Reeve), *sandwichensis* and *pacifica* (Pease): Martens & Langkavel, *l. c.* p. 20.

Volvaria fulgens and *pallidula*, spp. nn., Dunker, Mal. Bl. xviii. p. 153, Upolu.

PROBOSCIDIFERA TÆNIOGLOSSA.

CASSIDIDÆ and RANELLIDÆ.

Cassis pfeifferi, sp. n., Hidalgo, J. de Conch. xix. p. 226, ? Philippines.

Dolium lischkeanum, Küst., intermediate between *maculatum* and *tesselatum*, from Nagasaki: Lischke, Jap. Meeres-Conch. ii. p. 57.

Triton sequenzae, sp. n., Aradas & Benoit, Atti Acc. Gioen. (3) v., Sicily [confounded by former authors with the exotic *T. variegatus* (Lam.)].

Triton saulæ (Reeve) beautifully figured by Lischke, *l. c.* pls. 1 & 2, Japan; S. American specimens of *T. olearium* (L.) are identical with others from the Mediterranean and Japan, *ibid.* p. 34; *T. læbbeckii* (Lischke), *exaratus*, and *ranelloides* (Reeve), *ibid.* pp. 35-37, the first figured, pl. 4. figs. 13 & 14; *T. oregonensis* (Redfield) = *cancellatus* (Middend., nec Lam.), *ibid.* p. 166, Enosima, near Yeddo.

Tritonium granulatum and *fraterculus*, spp. nn., Dunker, Mal. Bl. xviii. p. 166, Bass's Straits.

Tritonium intermedium (Pease), Martens & Langkavel, *l. c.* p. 3, pl. 1. fig. 6, Sandwich I.; *T. pusillum* (Pease) and *tuberosum* (Lam.) criticised, *ibid.* pp. 3 & 4.

Epidromus papillatus, sp. n., Dunker, *l. c.*, Fiji I.

Triton (*Cumia*) *speciosa*, sp. n., Angas, P. Z. S. 1871, p. 13, pl. 1. fig. 1, Pt. Jackson.

Ranella elegantula, sp. n., Dunker, *l. c.* p. 165, Upolu.

CERITHIOPSIDÆ [see also CERITHIIDÆ].

Cerithiopsis bilineata (*Cerithium*, Hörnes, 1848) = *barleei* (Tiberi, 1869), and is found both in the tertiary formation of the Vienna basin and as a recent shell in the Mediterranean: Brusina, Bull. Malac. iv. pp. 5-7.

Cerithiopsis clathrata and *crocea*, spp. nn., Angas, *l. c.* p. 16, pl. 1. figs. 12 & 13, Pt. Jackson.

CYPRÆIDÆ.

Cypræa. SEARLES WOOD supposes that several spp. of the section *Trivia*, as in many spp. of *Cassis*, have the edge of the aperture denticulated before being full-grown, as he has never seen a *Trivia* with a sharp thin edge to the aperture: Ann. N. H. (4) vii. pp. 171 & 172. JEFFREYS (*ibid.* p. 245), however, has observed such specimens.

Cypræa princeps (Gray) lives on the shores of Australia, Crosse, J. de Conch. xix. p. 160. *C. staphylea*, var. *spadix* (Mighels), Martens & Langkavel, *l. c.* p. 34, pl. 2. fig. 2, Sandwich I.; *C. madagascariensis* (Gmel.) has been received from the Sandwich I.; and Madagascar appears somewhat

doubtful as a locality for it, *id. ibid.* On doubtful localities for *C. moneta* and *ammulus* (L.), *cf.* Lischke, *Jap. Meeres-Conch.* ii. pp. 64 & 65.

Erato sandwicensis (Pease), Martens & Langkavel, *l. c.* p. 20, pl. 1. fig. 13.

NATICIDÆ.

Natica rubromaculata, sp. n., Smith, P. Z. S. 1871, p. 733, pl. 75. fig. 13, Wydah.

Natica draparnaudi (Récluz?, Reeve) and *N. pelvis-tigrina* (Chemn.) = *maculosa* (Lam.), Lischke, *l. c.* pp. 74 & 75, S. Japan.

Sigaretus australis, sp. n., Dunker, *Mal. Bl.* xviii. p. 151, Pt. Mackay.

PROBOSCIDIFERA GYMNOGLOSSA.

PYRAMIDELLIDÆ.

DE FOLIN, under the title "D'une méthode de classification pour les coquilles de la famille des Chemnitzidæ," gives a synopsis of the characters of the 16 genera which he admits into this family: *Ann. Soc. L. Maine-et-Loire*, xii. pp. 12.

Pyramidella propinqua (A. Ad.), on its relations to *P. mitralis*, *cf.* Martens & Langkavel, *l. c.* p. 28.

Syrnola tincta, sp. n., Angas, P. Z. S. 1871, p. 15, pl. 1. fig. 11, Pt. Jackson.

Obeliscus (*Syrnola*) *gracillima*, sp. n., Smith, P. Z. S. 1871, p. 734, pl. 75. fig. 17, Wydah.

Monoptygma (*Myonia*) *puncturata*, sp. n., *id. ibid.* fig. 16, Wydah.

Odostomia sulcifera, *id. l. c.* p. 735, fig. 19, Wydah; *O. simplex*, Angas, *l. c.* fig. 10, Pt. Jackson: spp. nn.

Odostomia lactea (Dunker, *nec* Angas) and *fasciata* (Dunker), Lischke, *l. c.* pp. 79 & 80, Nagasaki.

Turbonilla cingulata (Dunker), *id. ibid.* p. 80, Japan.

Turbonilla costifera, sp. n., Smith, *l. c.* fig. 18, Wydah.

Agatha australis, sp. n., Angas, *l. c.* fig. 9, Pt. Jackson.

Mathilda elegantula, sp. n., *id. ibid.* fig. 8, Pt. Jackson.

Aclis carinata, sp. n., Smith, *l. c.* p. 734, pl. 75. fig. 20, Wydah.

Scaliola caledonica (Crosse, 1870), J. de Conch. xviii. p. 299, xix. p. 200, pl. 6. fig. 3, New Caledonia.

EULIMIDÆ.

Eulima dentiens, sp. n., Dunker, *Mal. Bl.* xviii. p. 152, Fiji I.

Eulima aciculata (Pease), Martens & Langkavel, *l. c.* p. 29, pl. 1. fig. 22, Tahiti; *E. major* (Sow.) is variable in its curvature; *E. subpellucida* (Pease), var. with sutural edge, from Tahiti, *ibid.* pp. 28 & 29.

Liostraca lesbia, sp. n., Angas, *l. c.* p. 16, pl. 1. fig. 14, Pt. Jackson.

TOXIFERA.

CONIDÆ.

Conus cooki and *rossiteri*, Brazier, J. de Conch. xviii. pp. 300 & 301, Botany Bay; *C. julii*, Liénard, *ibid.* p. 304, xix. p. 71, pl. 1. fig. 6, Mauritius: spp. nn.

Conus purus (Pease), from Nihaan I.; *fusiformis* (Pease), being preoccupied, is renamed *parvus*; *neglectus* (Pease) = *flavidus*, var.; and *prætextus* (Reeve) is distinct from *encaustus* (Kien.): Pease, J. de Conch. xix. pp. 98-100. *C. parvus* (Pease), Martens & Langkavel, l. c. p. 32, Sandwich I. *C. rhododendron* (Couth.) is only found after heavy gales on the reefs of Australia, Brazier, P. Z. S. 1871, p. 585; received from the Carolines, Martens & Langkavel, l. c. *C. fulmen* (Reeve), from Nagasaki, Lischke, Jap. Meeres-Conch. ii. p. 24.

PLEUROTOMIDÆ.

Pleurotoma dentatum [a] (Souverbie, 1869), J. de Conch. xviii. p. 431, pl. 14. fig. 5, New Caledonia.

Pleurotoma spiralis, Smith, P. Z. S. 1871, p. 731, pl. 75. fig. 8, Wydah; *P. (Turris) peaseana*, Dunker, Mal. Bl. xviii. p. 158, Indian Ocean: spp. nn.

Drillia rufescens, Upolu, and *dense[sic]plicata*, Bass's Straits, Dunker, l. c. p. 159, spp. nn.

Drillia acuminata (Mighels), Martens & Langkavel, l. c. p. 1, pl. 1. fig. 1, Sandwich I.

Clathurella pumila (Mighels), *producta* and *rugosa* (Pease), *ibid.* l. c. pp. 1 & 2, pl. 1. figs. 2, 3, & 5, Sandwich I.

Clathurella corrugata, *concinna*, *picta*, *purpurascens*, *heptagona*, *turricula*, *cincta*, *granosa*, *fuscolineata*, *fenestrata*, *punctata*, and *solidula*, Upolu, *pusilla*, Fiji I., Dunker, Mal. Bl. xviii. pp. 159-163; *C. labiosa*, Smith, l. c. fig. 9, Wydah; *C. hayesiani*, *tenuilirata*, *sculptilis*, *bicolor*, *brazieri*, *albocincta*, and *bilineata*, Angas, l. c. pp. 17 & 18, pl. 1. figs. 17-23, Pt. Jackson: spp. nn.

Daphnella philippiana, sp. n., Dunker, l. c. p. 164, Upolu.

Daphnella bella (Pease), Martens & Langkavel, l. c. p. 2, pl. 1. fig. 4, Sandwich I.

Cithara hanleyi, sp. n., Dunker, l. c. p. 164, Upolu.

Mangilia crassicostata, Fiji I., *costulata*, Upolu, Dunker, l. c. pp. 164 & 165; *M. angulosa*, Smith, l. c. p. 731, pl. 75. fig. 10, Wydah: spp. nn.

TEREBRIDÆ.

Terebra (Hastula) brazieri, Angas, l. c. p. 16, pl. 1. fig. 15, Pt. Jackson; *T. (Abretia) knockeri*, Smith, l. c. p. 730, pl. 75. fig. 7, Wydah: spp. nn.

Terebra swainsoni, var. *inflexa* (Pease), and *pura* (Desh.), Martens & Langkavel, l. c. p. 26, pl. 1. figs. 20 & 21, Polynesian I.

CANCELLARIIDÆ.

Cancellaria rougeyroni and *lamberti*, spp. nn., Souverbie, J. de Conch. xviii. pp. 427 & 428, pl. 14. figs. 1 & 2, Art I., New Caledonia.

ROSTRIFERA TÆNIOGLOSSA.

STROMBIDÆ.

Strombus floridus (Lam.), a var. with blackish throat is recorded from Nagasaki by Lischke, Jap. Meeres-Conch. ii. p. 23.

PHORIDÆ.

Xenophora (*Phorus*) *australis*, Soubervie, *l. c.* p. 423, pl. 14. fig. 4, New Caledonia; *X. lamberti*, *id. ibid.* xix. p. 334, Pine I., New Caledonia: spp. nn.

OVULIDÆ.

Ovula caledonica, sp. n., Crosse, *J. de Conch.* xix. p. 206, New Caledonia.

CERITHIIDÆ.

Vertagus fasciatus (Brug.), a var. described under the name *persulcatus*, Martens & Langkavel, *l. c.* p. 37, Paumotu I.

Cerithium tubulus, Bass's Straits, *fuscum*, Samoa I., spp. nn., Dunker, *Mal. Bl.* xviii. p. 152.

Cerithium ianthinum and *pusillum* (Gould), *rostratum* (Sow.), Sandwich I. and Tahiti: Martens & Langkavel, *l. c.* pp. 35 & 37, pl. 2. figs. 3 & 5.

Bittium scalatum, sp. n., Dunker, *l. c.* p. 153 (locality not indicated).

Cerithium (*Cerithiopsis*?) *gemmuliferum* and *carinatum*, spp. nn., Smith, *l. c.* p. 736, pl. 75. figs. 21 & 22, Wydah.

Triforis corrugata (Hinds), Kingsmill I., *marmorata* and *cingulifera* (Pease), Sandwich I., Martens & Langkavel, *l. c.* pp. 37 & 38, pl. 2. figs. 6 & 8; *Tr. incisa* (Pease), *ibid.* p. 37.

Lampania multiformis (Lischke), varr., Lischke, *Jap. Meer.-Conch.* ii. p. 69, pl. 5. figs. 23 & 24, Nagasaki and Yokohama, in brackish water.

MELANIIDÆ.

Melania pluvialis, Mousson, *J. de Conch.* xix. p. 32, Tongataboo (in ponds of rain-water); *M. mariei*, Gassies, *Act. Soc. L. Bord.* xxviii. p. 159, New Caledonia: spp. nn.

Melania mauianensis (Lea) and *ulanensis* (Pease), Martens & Langkavel, *l. c.* p. 38, pl. 2. figs. 9 & 10; on variability of *M. newcombi* (Lea), cf. *ibid.* *M. lamberti* (Crosse, 1869) described, *J. de Conch.* xviii. p. 419.

Melanopsis prærosa (L.), var., probably = *ammonis* (Tristram), and *costata* (Oliv.), var., = *sauleyi* (Bourg.), from Palestine: Martens, *Mal. Bl.* xviii. pp. 59 & 60, pl. 1. figs. 8, 9, & 10, 11.

Melanopsis acutissima, sp. n., Gassies, *l. c.* p. 197, New Caledonia.

LITTORINIDÆ.

Littorina. RÉCLUZ records the occurrence of several of these shells above the ordinary tide-level, and enumerates the spp. found on the oceanic coasts of France as follows:—a. *Littorina* proper, ovate or conical, generally with spiral furrows and viviparous; spp. *littorea* (L.), *nigrolineata* (Gray), *rudis* (Maton), *jugosa* (Mont.), of which *saxatilis* (Bean) is considered a dwarf var.; *neritoides* (L.), *patula* (Thorpe), *tenebrosa* (Mont.): b. *Neritrema*, Récluz (new name), globular, smooth, oviparous; spp. *obtusata* (L.), *palliata* (Say), *vittata* (Phil.). *Act. Soc. L. Bord.* xxvii. 1870 (in 'Mélanges malacologiques,' under the title "Quelques observations sur les Littorines, et Catalogue des espèces de nos côtes"), pp. 42-47: N.B. this paper was written in 1854.

Littorina exigua (Dunker)=*granularis* (Reeve, Schrenck, nec Gray); *L. sinensis* (Phil.), Nagasaki: Lischke, Jap. Meeres-Conch. ii. pp. 70 & 71.

Littorina strigata, sp. n., *id.* Mal. Bl. xviii. p. 148, and *l. c.* p. 73, pl. 5. fig. 22, Nagasaki.

L. (Melaraphe) vitiensis, sp. n., Dunker, Mal. Bl. xviii. p. 150, Fiji I.

Melaraphe blanfordi, sp. n., *id. ibid.*, Rockhampton.

Cremnoconchus. The anatomy of *C. syhadrensis* has been examined by STOLICZKA, who comes to the conclusion that it agrees in all essential points with *Littorina*, but that the latter has very remarkable affinities with the *Cyclostomidae*—also that “it is not advisable to use the breathing-organ as an important character in the principal classification of the *Mollusca*.” The gills of *Cremnoconchus* are stated to consist of a single rather narrow plume, composed of thin fillets, which grow on the upper-side of the gill-cavity. P. As. Soc. Beng., May, 1871, pp. 108–115, woodcut.

Fossarus azonus (*Stomatia*, Brusina, 1865) = *Natica crosseana* (Kleciach, 1868) = *F. petitianus* (Tiberi, 1868), from the Mediterranean, and may, perhaps, become the type of a new genus, *Megalomphalus*. Brusina, Bull. Malac. iv. pp. 7–9.

Fossarina petterdi, Brazier, J. de Conch. xviii. p. 303, xix. p. 323, pl. 12. fig. 1, Tasmania; *P. brazieri*, Angas, *l. c.* p. 18, pl. 1. fig. 24, Pt. Jackson: spp. nn.

PLANAXIDÆ.

Planaxis striatulus (Phil.) = *plumbeus* (Pease) and *P. labiosus* (A. Ad.), Martens & Langkavel, *l. c.* pp. 41 & 42, pl. 2. figs. 11 & 12, Sandwich I.; *P. abbreviatus* (Pease), *ibid.* p. 46, Tahiti.

RISSOIDÆ.

Rissoina lamberti, Souverbie, J. de Conch. xviii. p. 425, pl. 14. fig. 6, Art I. N. Caledonia; *R. crassa*, Angas, *l. c.* p. 17, pl. 1. fig. 16, Pt. Jackson: spp. nn.

Rissoa membranacea (Adams). Mörch, Vid. Medd. 1871, p. 189, distinguishes the following varr.:—1. *octona* (Mohrenstern, nec L.); 2. *membranacea*, type; 3. *labiosa*, Mont., with a stronger shell, (3a) with red lines, (3b) minor, = *cornea* (Lovén) = *Paludinella vulgaris* (Ørsted).

Hydrobia (Paludinella) stagnalis (Baster) = *ventrosa* (Montagu, Jeffr.) = *baltica* (Nilss.) = *Helix octona* (L.); and, as a second species, *H. (P.) ulvæ* (Penn.) = *jeveensis* (Schröter), with var. *grandis*, 9–9½ millims. long; both on the Danish coasts, and often in company. *Id. l. c.* p. 188.

Paludestrina legrandiana and *wisemaniana*, spp. nn., Brazier, P. Z. S. 1871, pp. 698 & 699, Tasmania.

Ammicola grana (Say) found in Missouri by Tryon, Am. Nat. iv. p. 58.

PALUDINIDÆ.

Paludina? *solida* (Phil.), Pfeiffer, Nov. Conchol. iv. p. 25, pl. 114. figs. 17 & 18, Peru.

Bithynia tentaculata (L.), var. *producta* (Moq.-Tand.), Clessin, Nachr.

malak. Ges. iii. p. 129. *B. similis* (Leach), var. *minor*, $2\frac{1}{2}$ millims. long, occurs in salt water: Mörch, *l. c.* p. 185.

AMPULLARIIDÆ.

Ampullaria crosseana, sp. n., Hidalgo, J. de Conch. xix. p. 206, Amazon R.

Ampullaria werneana (Phil.), Pfeiffer, Nov. Conchol. iv. p. 22, pl. 114. figs. 1-5, White Nile.

TURRITELLIDÆ.

Turritella (*Torcula*) *subsquamulosa*, sp. n., Dunker, Mal. Bl. xviii. p. 152, Bass's Straits.

Eglsia subdecussata (*Scalaria id.*, Cantraine) = *Cerithium piragni* (Benoit) = *Mesalia striata* (A. Adams), dredged off Arcachon. Operculum paucispiral, with lateral nucleus, as in *Scalaria* and *Littorina*, and no twisted apical nucleus of the shell to be seen. Fischer, Act. Soc. L. Bord. xxvii. p. 115.

VERMETIDÆ.

The Mediterranean spp. are recapitulated by Mörch from a former paper in P. Z. S. 1860-62 and -65, with a few corrections. Mal. Bl. xviii. pp. 128-131.

CÆCIDÆ.

Cæcum glabrum (Mont.): the septum is of all intermediate forms, from hemispherical to lenticular. FOLIN, Act. Soc. L. Bord. xxvii. p. 117.

CALYPTRÆIDÆ.

Calyptra (*Calyptræa*) *rugulosa*, sp. n., Dunker, Mal. Bl. xviii. p. 151, Swain's I., Polynesia.

Crepidula aculeata (Gmel.) is widely distributed, occurring in Japan, N. Holland, N.W. America, Panama, Peru, Brazil, W. Indies, and W. coast of Africa: Lischke, Jap. Meeres-Conch. ii. pp. 76 & 77. *C. plana* (Say); for account of its ovi-capsules, cf. Am. Nat. iv. p. 59.

CAPULIDÆ.

Amalthea rugulosa, sp. n., Dunker, *l. c.*, Samoa I.

ROSTRIFERA PTENOGLOSSA.

SCALARIIDÆ.

Scalaria. Turbo clathrus, var. 1 in Linné's Mus. Ludov. Ulr. = *Sc. pseudoscalaris* (Brocchi); var. 2 = *Sc. communis* (Lam.). Récluz, Act. Soc. L. Bord. xxvii. pp. 57 & 58.

Scalaria perplexa (Pease), Martens & Langkavel, *l. c.* p. 24, pl. 1. fig. 19, Sandwich I.

Scala miranda and *bairdii*, Smith, P. Z. S. 1871, p. 734, pl. 75. figs. 14 & 15, Wydah; *S. (Cirsotrema) mörchi*, Angas, *ibid.* p. 15, pl. 1. fig. 7, Pt. Jackson: spp. nn.

SCUTIBRANCHIATA.

PODOPHTHALMA.

NERITIDÆ.

Nerita hilleana and *samoensis*, spp. nn., Dunker, Mal. Bl. xviii. p. 167, Samoa I.

Neritoglobus [= *Theodoxus* (Montf.)] and *Neritoconus*, new subgeneric divisions of *Neritina*, types *N. fluviatilis* (L.) and *N. valentina* (Graells), are proposed by Kobelt, Cat. eur. Binnenconchyl. pp. 66 & 67.

Neritina fluviatilis: a var. is described under the name *elongata* by Broeck, Ann. Mal. Belg. v. p. 33, Belgium. *N. sandwichensis* (Desh., Moll. Réunion), not being found on the Sandwich I., is renamed *deshayesi*: Pease, J. de Conch. xix. p. 101. *N. rubida* (Pease), Martens & Langkavel, l. c. pl. 2. fig. 13, and its operculum described, *ibid.* p. 46. *N. picea* (Reeve) and *reticulata* (Sow.): opercula described, *ibid.* l. c. p. 44.

Neritina (*Vitta*) *pulcherrima*, sp. n., Angas, P. Z. S. 1871, p. 19, pl. 1. fig. 24, Pt. Jackson.

Neritina (*Clithon*) *ualanensis* (Less.) = *mertoniana* (Récl.), and *N. dispar* (Pease): on their opercula and varr., cf. Martens & Langkavel, l. c. p. 45.

TROCHIDÆ.

Phasianella graeffei, sp. n., Dunker, Mal. Bl. xviii. p. 168, Samoa I.

Alcyon rubra (Pease), Martens & Langkavel, l. c. p. 47, pl. 2. fig. 14, Sandwich I.

Calcar modestus [sic] (*Trochus id.*, Reeve) = *middendorfi* (Phil.): Lischke, Jap. Meeres-Conch. ii. p. 82, Nagasaki.

Delphinula arion (*Turbo id.*, Meuschen, 1787) = *sphærulea* (Kien.): Roeters v. Lennep, J. de Conch. xviii. p. 380.

Cyclostrema striatum (*Valvata id.*, Philippi) = *Delphinula duminnyi* (Requien), found at Arcachon. Operculum like that of *Trochus*, but the shell not nacreous. Fischer, Act. Soc. L. Bord. xxvii. p. 111.

Cyclostrema tricarinata [um] and *roseotincta* [um], spp. nn., Smith, P. Z. S. 1871, p. 737, pl. 75. figs. 26 & 27, Wydah.

Liotia speciosa, sp. n., Angas, *ibid.* p. 19, pl. 1. fig. 26, Pt. Jackson.

Solariaella canaliculata, sp. n., Smith, l. c. p. 736, pl. 75. fig. 28, Wydah.

Adeorbis striatella (Souverbie, 1869), J. de Conch. xviii. p. 424, pl. 14. fig. 7, New Caledonia.

Leptothyra rubricincta (Mighels) and *rubrilineata* (Garrett): Martens & Langkavel, l. c. p. 48, pl. 2. figs. 17 & 16, Sandwich I.

Globulus superbus (Gould), Lischke, Jap. Meeres-Conch. ii. p. 83, pl. 5. figs. 18-21, Nagasaki.

Ethalia lirata and *plicata*, spp. nn., Smith, l. c. p. 737, pl. 75. figs. 23 & 24, Wydah.

Teinostoma solida [um], sp. n., *id. ibid.* fig. 25, Wydah.

Trochus (*Chlorostoma*) *argyrostomus* (Gmel.), with var. *Chl. rugatum* (Gould), *T. rusticus* (Gmel.), *T. nigerrimus* (Gmel.), with varr. *Chl. corrugatum* (A. Adams) and *T. distinguendus* (Dunker), *T. carpenteri*, *pfeifferi*, *brunneus*, and *nigricolor*, all from Japan: Lischke, Jap. Meeres-Conch. ii. pp. 87-91.

Trochus hiliaris and *alwinæ*, Lischke, Mal. Bl. xviii. pp. 41 & 149, *id. l. c.* pp. 84 & 85, pl. 6. figs. 17-19, and pl. 5. figs. 14 & 15, Nagasaki; *T. tenuiliratus*, Dunker, Mal. Bl. xviii. p. 168, Samoa I. : spp. nn.

Trochus vitiligineus (Menke) and *neritoides* (Phil.) : Lischke, J. M.-Conch. ii. pp. 86 & 87, Japan.

Clanculus rubicundus, sp. n., Dunker, *l. c.*, Fiji I.

Ziziphinus venustus, Fiji I., *multigrunus*, St. Vincent, N. Holland, and *subgranularis*, Bass's Straits, Dunker, *l. c.* pp. 169 & 170 : spp. nn.

Monilea philippiana, sp. n., *id. l. c.* p. 170, Samoa I.

Euchelus denigratus (Chemn.) = *atratus* (Gmel.), and occurs in the Indian and Pacific seas, Martens & Langkavel, *l. c.* p. 48; *E. gemmatus* (Gould), *ibid.* pl. 2. fig. 17, Sandwich I.

Margarita striatula (Garrett) : *ibid. ibid.* pl. 2. fig. 19, Sandwich I.

Stomatella mariei, sp. n., Crosse, J. de Conch. xix. p. 329, N. Caledonia.

Stomatella splendidula and *notata* (A. Ad.) : Martens & Langkavel, *l. c.* pp. 48 & 49, Paumotu I.

Gena callosa, Fischer, J. de Conch. xix. p. 218, Suez (figured in Descr. de l'Egypte, Moll. pl. 5. fig. 10); *G. caledonica*, Crosse, *ibid.* p. 330, N. Caledonia : spp. nn.

Microtina : Crosse, *ibid.* pp. 188-193, monographs this genus, and catalogues its known spp.

Microtina heckeliana (Crosse, 1870), *ibid.* p. 191, pl. 6. fig. 2.

Microtina compta, sp. n., Martens & Langkavel, *l. c.* p. 49, Paumotu I.

Scutellina pulchella, sp. n., Lischke, Mal. Bl. xviii. p. 41, and J. M.-Conch. ii. p. 100, pl. 6. figs. 20-23, Nagasaki.

Haliotis gruneri (Phil.), var., and *H. supertexta* (Lischke) : Lischke, J. M.-Conch. ii. pp. 91 & 92, pl. 6. figs. 13-16, Nagasaki.

EDRIOPHTHALMA.

FISSURELLIDÆ.

Fissurella (*Glyphis*) *granifera* (Pease) : Martens & Langkavel, *l. c.* p. 50, pl. 2. fig. 19.

Rimula verrieri, sp. n., Crosse, J. de Conch. xix. p. 205, New Caledonia.

CYCLOBRANCHIATA.

DALL, P. Bost. Soc. 1871, Ann. N. H. (4) vii. pp. 286-290, reprints his "Sketch of a natural arrangement of the order *Docoglossa*" (Troschel : *cf.* Zool. Rec. vii. p. 144).

TECTURIDÆ.

[*Tectura*] *Acmæa patina* (Esch.), with varr. *scutum* (Esch.), *cumingii* and *verriculata* (Reeve), *fenestrata* and *tessellata* (Nuttall), and *pintadina* (Gould), Hakodadi and Castries Bay; *A. heroldi* (Dunker), with varr. *comulus* and *pygmæa* (Dunker), Nagasaki; *A. schrenckii* (Lischke), *A. concinna* (*id.*) = *granostrata* (Schrenck, *nec* Reeve), Nagasaki and Hakodadi : Lischke, J. M.-Conch. ii. pp. 93-99, the last figured on pl. 6. figs. 1-6.

Tectura conoidalis (Pease) : on its variability, *cf.* Martens & Langkavel, *l. c.* p. 51.

PATELLIDÆ.

Patella amussitata, *toreuma*, and *nigrolineata* (Reeve). Several varr. are recorded from Nagasaki : Lischke, *l. c.* pp. 100-103, pl. 6. figs. 7-12, and pl. 7. figs. 1-4.

Patella sandwichensis (Pease), *stellæformis* (Reeve) = *pentagona* (Reeve, nec Born), and *cretacea* (Reeve) shortly described : Martens & Langkavel, *l. c.* p. 50.

Patina pellucida (L.) : jaw described by Bergh, Verh. z.-b. Wien, xxi. p. 1299, pl. 13. figs. 1-3.

Patina tella, sp. n., *id. ibid.* p. 1297, pl. 12. figs. 12-26, Atlantic gulf-weed.

LEPETIDÆ.

Lepeta cæca (Müll.) : jaw described, *id. ibid.* p. 1300, pl. 13. figs. 4-7.

TECTIBRANCHIATA.

TORNATELLIDÆ.

Ringicula. A similar supposition to that relating to *Cypræa* (*cf. supra*, p. 136) is advanced concerning *Ringicula* by Searles Wood, Ann. N. H. (4) vii. pp. 171 & 172, and is also refuted by Jeffreys, *ibid.* p. 245.

Ringicula suturalis, sp. n., Smith, P. Z. S. 1871, p. 733, pl. 75. fig. 12, Wydah.

Ringicula arcata (Gould), Lische, J. M.-Conch. ii. p. 78, pl. 5. figs. 16 & 17, Nagasaki.

Tornatella ziczac (*Voluta*, Mhlfd. 1818) = *Bullina lauta* (Pease) : Martens & Langkavel, *l. c.* p. 51, pl. 2. fig. 20. *T. strigosa* (Gould), Lischke, *l. c.* p. 104, Nagasaki.

Buccinulus niveus, sp. n., Angas, P. Z. S. 1871, p. 19, pl. 1. fig. 27, Pt. Jackson.

BULLIDÆ.

Tornatina knockeri, sp. n., Smith, *ibid.* p. 738, pl. 75. fig. 30, Wydah.

Hyalina (*Volvarina*) *mustelina*, sp. n., Angas, *l. c.* p. 14, pl. 1. fig. 5, Pt. Jackson.

Volvula cylindrica, sp. n., Smith, *l. c.* fig. 29, Wydah.

Retusa truncata (Mont.) = *semisulcata* (Phil.), nec *truncatula* (Brug.) : Mörch, Vid. Medd. 1871, p. 176.

Hydatina guamensis (Quoy & G.), Pacific analogue to the W.-Indian *undata* (Brug., nec A. Adams), = *nitidula* (Dillw.) = *elegans* (Menke) : Martens & Langkavel, *l. c.* p. 52.

Haminea nigropunctata (Pease) : *iid. ibid.* pl. 3. fig. 6 (shell).

Atys debilis (Pease) is different from *succisus* (Ehrenb.), but apparently = *alricula* (Sowerby & Reeve, nec Ehrenb.), *iid. ibid.* p. 53, pl. 3. fig. 3, Tahiti; *A. semistriatus* (Pease), *ibid.* fig. 2, Sandwich I.

LOPHOCERCIDÆ.

Volvatella piriformis (Pease), *iid. ibid.* p. 54, pl. 2. fig. 21, Tahiti.

Lophocercus viridis (Pease), *iid. ibid.* pl. 3. fig. 4 (shell), Tahiti.

Lobiger pictus (Pease), *iid. ibid.* pl. 3. fig. 5 (shell), Tahiti.

APLYSIIDÆ.

Aplysia (Siphonota) elongata (Pease), *iid. ibid.* pl. 3. fig. 6 (shell), Sand-
wich I.

NUDIBRANCHIATA.

VERRILL (Am. J. Sc. 1. p. 405) gives descriptions of some New-England
Nudibranchiata.

PHYLLIDIIDÆ.

Corambe sargassicola (Bergh, Nat. Tids. v.). Gills only at the hinder end
of body, between mantle and foot; vent median, between the gills; jaw and
radula described. Bergh, Verh. z.-b. Wien, xxi. pp. 1293-1297, pl. 11.
figs. 21-27, pl. 12. figs. 1-11.

DORIDIDÆ.

Doris stellata. The specimens described by Cuvier under this name are
pilosa (Müll.); *D. tomentosa* (Cuv.) allied to (but probably distinct from)
johnstoni (Ald. & Hanc.) and *coccinea* (Forbes), is redescribed by Fischer, J.
de Conch. xviii. pp. 291-293.

Doris depressa (A. & H.) and *Villiersia scutigera* (Orb.) are identical, two
ovisacs of parasitic *Crustacea* having been taken by the latter author for the
gills; *D. johnstoni*?, from Arcachon, is briefly described: *id.* Act. Soc. L.
Bord. xxvii. pp. 99 & 100.

Lamellidoris. Two probably new spp. from the Danish coasts described, but
not named, by Mörch, Vid. Medd. 1871, pp. 179 & 180.

TRITONIIDÆ.

Scyllæa pelagica (L.) and a var. under the name *marginata*, from the gulf-
weed, described by Bergh, Verh. z.-b. Wien, xxi. pp. 1288 & 1292.

Dendronotus luteolus, sp. n., Lafont, Act. Soc. L. Bord. xxviii. p. 287, pl. 17.
fig. 1, "le chenal du cap Ferret," near Arcachon, S.W. France, on *Sertulariæ*.

Doto pygmæa, sp. n., Bergh, l. c. p. 1277, pl. 11. figs. 1-10, Atlantic gulf-
weed.

ÆOLIIDIDÆ.

Æolis drummondi (Thomps.), *landsburgi* (A. & H.), and *paradoxa* (Quatref.)
are briefly described, chiefly with regard to coloration, by Fischer, Act. Soc.
L. Bord. xxvii. pp. 101 & 102.

Æolis pallidula, sp. n., Lafont, *ibid.* xxviii. p. 287, pl. 17. fig. 2, Crassat de
Labillon, near Arcachon.

Hervia, g. n. Rhinophoria simplicia. Podarium antice angulis fortiter
productis. Pulvinaria papillarum dorsalium elongata, seriebus papillarum
obliquis, in posteriore parte arcuatim conjunctis, instructa. Margo mastica-
torius mandibulæ serie denticulorum unica. Radula uniseriata, paucidentata.
H. modesta, sp. n., Hellebæk, Copenhagen Sound. Bergh, Vid. Medd. 1871,
p. 183.

Matharena, g. n. Rhinophoria podariumque ut supra. Papillæ per series
transversas et obliquas, fere ut in *Cratena*, disposita. Margo masticatorius
mandibulæ serie denticulorum elongatorum acutorum præditus. Radula

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uniseriata, paucidentata, dentes cuspidate elongata, ad latera radices cuspidis minute denticulati. *M. oxyacantha*, sp. n., Limfjord, Jütland, *id. ibid.*

Cuthona pumilio, sp. n., *id. Verh. z.-b. Wien*, xxi. p. 1281, pl. 11. figs. 11-20, Atlantic gulf-weed.

Sparella sargassicola (Kröyer), *id. ibid.* p. 1283, pl. 13. figs. 9-19, Atlantic gulf-weed.

Tergipes claviger (Menke). Its development has been studied by SELENKA on the shores of Zandvoort, Holland. The egg-clusters, fixed on *Sertularia*, the cleaving of the yolk, which is effected in a somewhat different way to that in *Elysia* or *Cyclostoma*, the formation of the various organs, the embryonic shell and operculum, which is not large enough to completely close the opening, &c., are accurately described. *Nied. Arch. Z. i.* (1871) pp. 1-10, pls. 1 & 2.

Calliopæa bellula (Orb., 1837) = *Embletonia mariae* (Meyer & Möbius), shores of W. France and Baltic; *C. vesiculosa* (*Custiphorus id.*, Desh.), Algiers; *C. fucata* (Gould), Boston; *C. souleyeti* (Vérany), Nizza: Fischer, *J. de Conch.* xix. pp. 89-92.

Fiona atlantica (Bergh): Bergh, *Verh. z.-b. Wien*, xxi. p. 1287.

Glaucus atlanticus (Forst.) and *gracilis* (Bergh) described, *id. ibid.* pp. 1300-1302.

HERMÆIDÆ.

Beccaria tricolor (Trinchese, 1870) = *Caliphylla mediterranea* (Costa): Gentiluomo, *Bull. Malac.* iv. p. 110. The original description is translated in *Ann. N. H.* (4) vii. p. 391.

PHYLLIRRHODIDÆ.

Phyllirrhoe atlantica (Bergh) = *bucephala* (Eydoux & Souleyet, *neo* Péron), and particulars concerning its anatomy are given by Bergh, *l. c.* p. 1302.

PULMONATA.

GEOPHILA.

Hyalina cellaria, *Limax maximus* and *flavus* (= *variegatus*, Drap.), and *Arion fuscus*, slugs and snails living in cellars, are discussed by Binney, *Am. Nat.* iv. p. 166.

Instances of *Helix fatens* (Stud.), *H. setosa* (Ziegl.), *H. hortensis*, var. *arenicola* (Macg.), *H. arbustorum*, var. (Charp.), and *Hyalina alliaria* (Miller) being distinguished by a peculiar smell, are collected by the Recorder in *Nachr. malak. Ges.* iii. pp. 201 & 202.

For notices of the genital apparatus of *H. adspersa*, and renewal of the dart in *H. nemoralis* and *hortensis*, *cf. supra*, pp. 121 & 122.

ONCHIDIIDÆ.

Onchidium celticum (Cuv.) = *tuberculatum* (Crouan), described by Taslé, *Faune Mal. Mar.*, Suppl., and *J. de Conch.* xix. p. 368. Récluz treats of the

same sp., pointing out its literature, but without adding any information : Act. Soc. L. Bord. xxvii. (Mél. malac.), pp. 59-62.

VAGINULIDÆ.

[*Vaginulus*] *Veronicella*. The lingual dentition in precisely similar specimens from Florida, Jamaica, and Rio Janeiro is described and figured by Bland & Binney, Am. J. Conch. vii. pp. 163 & 164, pl. 12. fig. 7.

Vaginula grandidieri, sp. n., Crosse & Fischer, J. de Conch. xix. p. 331, Madagascar.

AGNATHA (TESTACELLIDÆ).

Strebelia berendti (Pfr.), Fischer & Crosse, Etud. p. 11 *et seq.*, pl. 1. fig. 1 (copied from Pfeiffer's fig. in Mal. Bl. 1861).

Glandina. A detailed anatomy of *G. sowerbyana* and *fusiformis* is given by FISCHER & CROSSE, l. c. pp. 70-81, pl. 4. figs. 6-15, and pl. 5, chiefly as regards the radula and nervous system. According to their investigations, the median tooth of the radula is rudimentary, the receptaculum seminis has a long stalk, and the cesophagal ring of ganglions is not fixed, but slides backwards and forwards, according to the different motions of the body. Eggs and embryos of *G. audebardi* are described and figured, pl. 4. figs. 11-13.

The spp. of Mexico and Central America are arranged by them as follows : —Sect. 1. spp. varicosæ, *Varicella*, Pfr. : **orizaba*, **speciosa*, and **cordovana* (Pfr.), **monilifera* (Pfr.) = *rubella* (Morelet), **stigmatica* and *delicatula* (Shuttl.), *boucardi* and *binneyana* (Pfr.), *uhdeana* (Martens), **plicatula* (Pfr.). Sect. 2. spp. striato-plicate, *Englandina*, C. et F. : **lignaria* (Rv.), *sowerbyana* (Pfr.), *vanuxemi* (Lea), *coronata* (Pfr.), **guttata* (C. et F.), **fusiformis* and **ghiesbreghtii* (Pfr.), **aurata* (Morelet), *rosea* (Fér.), **carmenensis* (Morelet), **insignis* (Pfr.), **longula*, sp. n., p. 111, pl. 6. fig. 6, San Juan, Mexico, *decussata* (Desh.) = *corneola* (Binn.), *amœna* (Martens), **nympha* (C. et F.), *largillierii* (Pfr.) = *yucatanensis* (Pfr.), *audebardi* (Desh.), *liebmanni* (Pfr.), *alabastrina* (Albers), **indusiata* and *decidua* (Pfr.), *cylindracea* (Phillips), *carnea* (Pfr.), *strigosa* (Martens), *multispira*, *turris*, and *albersi* (Pfr.), **bellula* (C. et F.), **filosa* (Pfr.), *candida* (Shuttl.), *turgida* and **conferta* (Pfr.), **difficilis* (C. et F.), **nana* (Shuttl.), and **perpusilla* (Pfr.). Sect. 3. spp. lævigatæ, *Oleacina* (Mart.) : *modesta*, *margaritacea*, *pulchella*, *conularis*, *oblonga*, *isabellina*, and **ambigua* (Pfr.) = **berendti* (Pfr.). All described, and those marked * figured, l. c. pp. 85-141, pl. 2. figs. 7-12, pl. 3, and pl. 6; the living animals of *G. plicatula*, pl. 2. fig. 12a, and of *G. fusiformis*, pl. 3. fig. 2a.

Petenia ligulata (Morelet), Guatemala, has tentacles straight at the tip and a muciparous gland at the end of the foot. *Iid. ibid.* pp. 66-69, pl. 1. fig. 17 (shell).

Streptostyla (Shuttl.). The anatomy of *S. sololensis* is fully described : *iid. ibid.* p. 15, pl. 4. figs. 1-5, 20. In most parts it agrees with that of *Glandina*; but there is no median tooth in the

radula, though there are more teeth in each row, and the labial palpi are less developed. The species of this genus are thoroughly separable from *Spiraxis*, which is a heterogeneous assemblage.

The Central-American and Mexican species are arranged as follows:—
Sect. 1. spp. striatæ: **nicoleti* (Shuttl.), *botteriana* (Cr. & Fisch.). Sect. 2. spp. sublævigatæ: *Chersomitra* (Martens): *pfeifferi* (new name for Pfeiffer's *Achatina streptostyla*), **blandiana*, and **binneyana* (C. & F.), *cylindracea* (Pfr.), *meridana* (Morelet), *biconica* and **delatruü* (Pfr.), **edwardsiana* and **sallæi* (C. & F.), *irrigua*, *limnæiformis*, and *flavescens* (Shuttl.), **cingulata* (C. & F.), **shuttleworthi* and *boucardi* (Pfr.), *coniformis* (Shuttl.), *delibata* and *labida* (Morelet), **boyeriana* and **bocourti* (C. & F.), **lurida* (Shuttl.), **fulvida*, **glandiformis*, and **cornea* (C. & F.), *cobanensis* (Tristram), **sololensis* (C. & F.), *physodes* (Shuttl.), *auriculacea*, *bullacea*, *oblonga*, *parvula*, **turgidula*, and **nigricans* (Pfr.), **mitraformis* (Shuttl.), and *catenata* (Pfr.). All described, l. c. pp. 14–64; those marked * figured, pl. 1. figs. 2–16, and pl. 3. figs. 1–6; the living animal of *S. nigricans*, pl. 1. fig. 15 b.

Ennea bicolor (type of the section *Huttonella*). Its anatomy exactly corresponds with that of *Streptaxis*. STOLICZKA, J. A. S. B. xl. p. 170, pl. 8. fig. 7, living animal.

Ennea cylindrelloidea, *id. ibid.* p. 171, pl. 7. fig. 4, Moulmein; *batalhana*, Pfeiffer, Mal. Bl. xviii. p. 71, pl. 1. figs. 17 & 18, Batalha, W. Africa: spp. nn.

Streptaxis. The anatomy of *S. obtusus*, sp. n., and *burmanicus* (Blf.) is given by STOLICZKA, l. c. pp. 161–163, pl. 8. No jaw; radula resembling that of *Testacella*; generative organs of simple form, vas deferens without any appendages; a few large eggs.

Streptaxis solidulus, *obtus*, and *hanleyanus*, spp. nn., *id. l. c.* pp. 166–168, pl. 7. figs. 10–15, Moulmein; the differences of *burmanicus* (Blf.) and *blanfordianus* (Theobald) are discussed, *ibid.* pp. 163 & 164, pl. 7. figs. 5–9; *sankayanus* (Bens.), *ibid.* p. 167, fig. 14. *S. pellucens* (Blfd.), Cambodja, and *exacutus* (Gould), Mergui: Pfeiffer, Nov. Conch. iv. pp. 29 & 30, pl. 115. figs. 11–14.

Patula gradata (Mouss.) agrees with the *Testacellidæ* in the radula and in wanting a jaw. Perhaps the whole section *Charopa* and some *Endodontæ* are to be transferred to this family. SEMPER, Nachr. malak. Ges. iii. pp. 124 & 125.

OXYGNATHA (ZONITIDÆ).

HEYNE-MANN, Nachr. malak. Ges. iii. p. 92 *et seq.*, refers to the American spp. of *Limax*.

LEYDIG (JH. Ver. Württ. 1871, pp. 210–228, 271) gives some useful notes concerning the specific distinctions and occurrence of various European slugs.

Limax maximus (Linn.)=*cinereoniger* (Wolf, Heynemann) : Westerlund, Fauna moll. Suec. pp. 11-14, Expos. crit. p. 14.

Limax cærulans (Bielz, 1853)=*dacampi* (Menegazzi, 1855), and its varieties and occurrence in N. Italy are stated by Strobel, Bull. Malac. iv. pp. 17-23. A still older name for the same is *lineatus* (*Arion id.*, Dumont, 1849), *id. ibid.* p. 107.

Limax arborum (Bouch.) [*marginatus*, Müll.]. The embryo and a small Nematoid found within it: Broeck, Ann. Mal. Belg. v. pp. 17 & 64, pl. 5. figs. 6b, 7, & 8. Varr. of this sp. are described under the names *roseus* and *coloratus*, *id. ibid.* pp. 49-53, from Luxemburg.

Limax norvegicus [= *agrestis ferus* (Malm)] and *nucronatus*, Westerlund, l. c. pp. 22 & 26, Exp. crit. pp. 17 & 18, Norway and Sweden; *montanus*, Leydig, l. c. p. 224, Seiser-alp, S. Tyrol; *mouensis*, Gassies, Act. Soc. L. Bord. xxviii. p. 14, N. Caledonia; *guatemalanus*, Crosse & Fischer, J. de Conch. xviii. p. 297, Guatemala : spp. nn.

Limax (*Agriolimax*) *rarotonganus*, sp. n., Heynemann, Nachr. malak. Ges. iii. pp. 43 & 44, Rarotonga, Cook's Archipelago, Pacific (very near *agrestis*, L.).

Parmacella olivieri (Cuv.), from Samarcand. Animal in spirits and jaw described, and shell figured by the Recorder, Mal. Bl. xviii. p. 63, pl. 1. figs. 15 & 16. The latter is really external in the young animal, and internal in the adult; and it is probable that various spp. may prove to be founded on different ages of the same animal.

Vitrina. The species found hitherto in Germany, *pellucida* (Müll.), *draparnaldi* (Cuv.), *diaphana* (Drap.), *glacialis* (Forbes), *brevis* (Fér.), and *elongata* (Drap.), are comparatively described and figured, and a new sp. *heynemanni*, from Nassau, is added by Koch, Nachr. malak. Ges. iii. pp. 33-39, pl. 1.

Vitrina annularis (Venetz)=*plicosa* (Bielz), occurs in different parts of the Alps and in the Apennines, near Sienna : Martens, *ibid.* pp. 117-121. Also in Spain : Hidalgo, Hoj. malac.

Vitrina superba, sp. n., Cox, P. Z. S. 1871, p. 54, Queensland.

Helicarion sogdianus (Martens, 1869), Mal. Bl. xviii. p. 65, pl. 1. figs. 1-3, Samarcand (is a *Macrochlamys*, teste Semper).

Nanina sumatrensis (Mouss.), Sumatra, *clypeus* (Mouss.), Java, and *fulvizona* (Mouss.), Celebes : Pfeiffer, Nov. Conchol. iv. pp. 26-28, pl. 115. figs. 1-3, 5-10. *N. calias* (Bens.) and *cultrata* (Gould); lingual dentition resembles that of *Hyalina* or *Zonites*, but marginal teeth bifid : Bland & Binney, Am. J. Conch. vii. pp. 188 & 189, pl. 17. fig. 6.

Ariophanta (Desmoul.), founded probably on *Helix lævipes* (Müll.), may rightly be adopted for the Naninoid spp. of Cis-Gangetic India with rudimentary prolongations of the mantle : Martens, Mal. Bl. xviii. p. 143, footnote.

Macrochlamys (Bens.). For critical remarks concerning the history of this genus, cf. Stoliczka, J. A. S. B. xl. pp. 246 & 247.

Macrochlamys (*Durgella*) *honesta* (Gould). Several varieties of the shell, the living animal, and its anatomy, described, *id. ibid.* pp. 248-250, pl. 17. figs. 6-14.

Microcystis molecula (Bens.) : for account of its anatomy, cf. *id. ibid.* p. 251, pl. 18. figs. 11-13.

Nanina (subgen. *Microcystis*) *futunaensis*, sp. n., and *N. (M.) perpolita* (Mouss.), var. *solida*, Mousson, J. de Conch. xix. pp. 7 & 8, the first figured pl. 3. fig. 1, Tonga I.

Nanina (Trochonanina) tongana (Quoy). Full-grown specimens have a callosity on the columellar margin: *id. ibid.* p. 9.

Conulema, g. n. Shell conoid, thin, consisting of many whorls, usually spirally ribbed or striated; base convex, narrowly or indistinctly umbilicated; margin of aperture thin, not expanded, outer margin simple. Animal narrow, long; gland at the end of the foot, beneath a distinct horn; two shell- and two dorsal lobes on the mantle, all of them small and with no separately produced appendages. Jaw thin, smooth, indistinctly concentrically striated in the middle, &c. To this genus belong *Helix attegia*, *infula*, *cacuminifera*, *arx*, and *palmira* (Bens.), *gratulator* and *confinis* (Blf.), and *liricincta*, sp. n., from Moulmein. STOLICZKA, l. c. pp. 236-241, pl. 18. figs. 1-10.

Rotula (Albers). Type *Helix detecta* (Fér.). The soft parts of *R. anceps* (Gould) are described, and the spp. referable to this genus discussed: *id. ibid.* pp. 231-235, pl. 17. figs. 1-3.

Sophina (Bens.). Its conchological and anatomical characters pointed out. Foot long, obliquely truncate at its hinder end, with a large gland and distinct horn-like appendage; mantle-lobes as large as in *Helicarion*; arrow-sac with an enclosed, thick, pointed papilla; vas deferens with a long pointed appendage, provided with a peculiar muscle; jaw finely concentrically striate. *S. calias* (Bens.) = *schistostelis* (Bens.), *forabilis* (Bens.), *discoidalis*, and *conjungens*, spp. nn., all from Moulmein. *Id. ibid.* pp. 252-259, pl. 19.

Sesara (Albers) is to be distinguished from the other *Zonitidae* by the thickened columellar lip and toothed aperture; lobes of the mantle small; the receptaculum seminis is a long thin twisted sac, containing several horny curved tubes [spermatophores]; jaw smooth, finely radiato-striate on the inner side, with an obtuse middle projection. *S. infrendens* (Gould) = *capessens* (Bens.), and *S. pylaica* (Bens.) are more particularly described. *Id. ibid.* pp. 240-245, pl. 16. figs. 4-10.

Helicopsis (Beck, 1837, nec Fitzinger, 1833) has a glandular opening at the end of the foot; the mantle is wholly included within the shell. PEASE, P. Z. S. 1871, p. 455.

Trochomorpha trochiformis (Fér.), var. n. *pallens*, Moovea Island; *nigritella* (Pfr.), var. n. *oppressa*, Ponape I.; and *congrua* (Pease, 1868, preoccupied), renamed *contigua*: *id. ibid.* p. 456, and J. de Conch. xviii. pp. 398-400.

Helix (Trochomorpha) fessonia (Angas, 1869) = *transarata* (Mouss., 1870): Brazier, P. Z. S. 1871, p. 322.

[*Trochomorpha*] *Helix belmorii*, Cox, P. Z. S. 1871, p. 647, pl. 52. fig. 12,

Solomon I.; [T.] *H. (Videna) floodi, milligani, and pascoii*, Brazier, l. c. pp. 697 & 698, Tasmania: spp. nn.

Zonites (subgen. *Moreletia*). The anatomy of *Z. euryomphalus* (Morelet) is given by FISCHER, Etud. pp. 142-149 (pl. 8 not yet seen), who comes to the conclusion that it is next to the European type of *Zonites*, only the muciparous gland is somewhat more developed; the generative organs are simple, as in *Limax*. *Helix fuliginosa* (Griff.), *bilineata* and *caduca* (Pfr.) belong to the same subgenus.

Zonites tehuantepecensis, sp. n., Crosse & Fischer, J. de Conch. xviii. p. 297, Tehuantepec, Mexico.

[*Hyalina*] *Zonites capsella* (Gould), *ligerus* and *gularis* (Say): for lingual dentition, cf. Bland & Binney, Am. J. Conch. vii. p. 174.

Hyalina? (*Mörchia*) *baudoni* (Pétit); lingual dentition resembles that of *Macrocyclus*: *iid. ibid.* p. 175.

Zonites lucidus (Drap.) [*Hyalina draparnaldi*] entirely agrees anatomically with *H. cellarius*: Broeck, Ann. Mal. Belg. v. p. 15.

Hyalina subterranea (Bourg.) = adult *crystallina* (Müll.), Lehmann, Nachr. malak. Ges. iii. pp. 75-77. This opinion refuted by Reinhardt, *ibid.* pp. 108-110, 113-117.

Hyalina subrimata, sp. n., Reinhardt, SB. nat. Fr. 1871, p. 39 (allied to *crystallina*, Müll.), Moravian mountains, Galicia, Bukowina, Switzerland, and Italy.

Macrocyclus voyana (Newc.): for lingual dentition, cf. Binney & Bland, Am. J. Conch. vii. p. 175.

Leucochroa candidissima (Drap.): on varr. of this sp., including *hierochuntina* (Boissier) and *fimbriata* (Bourg.), cf. Martens, Mal. Bl. xviii. pp. 53 & 54.

ODONTOGNATHA and AULACOGNATHA.

Philomycus caroliniensis (Bosc.), jaw smooth, with a middle projection; *australis* (Bergh), from Sandwich I.; *dorsalis* (Binn.), jaw ribbed: Semper & Heynemann, Nachr. malak. Ges. iii. pp. 1 & 2, pl. 1. figs. 1 & 2, and Bergh, Verh. z.-b. Wien, xxi. pp. 793-796. Mörch ("Nullus character infallibilis," Nachr. malak. Ges. iii. pp. 90 & 91) thinks this difference important enough to found two genera, viz. *Pallifera*, Morse, with ribbed jaw and no sagitta, spp. *dorsalis* (Binn.), *caroliniensis* (Heynem., nec Bosc.), and *australis* (Bergh), the last perhaps introduced into Sandwich I., and *Philomycus* (Raf.), with jaw smooth, and sagitta present, sp. *caroliniensis* (Bosc.).

Arion: Heynemann, *ibid.* p. 92 et seq., refers to the American spp.

Arion citrinus and *limacopus*, spp. nn., Westerlund, Faun. moll. Suec. pp. 70 & 74, Sweden; according to this author, *ibid.* p. 66, Exp. crit. pp. 32, 35, 36, *Limax rufus* (L.) = *fuscus* (Müll.), nec *empiricorum* (Fér.).

Arion bicolor, Broeck, Ann. Mal. Belg. v. pp. 61-63, pl. 1. fig. 6, living animal and jaw; fig. 5, jaw of *A. fuscus* (Müll.), Luxemburg.

Sagda connectens and *haldemaniana* (C. B. Adams). Their lingual dentition is that of *Helix*, not of *Vitrina*; and the latter

species is viviparous: BINNEY & BLAND, *Am. J. Conch.* vii. pp. 175 & 176.

Patula solitaria (Say), jaw and lingual dentition, *ibid.* l. c. p. 176.

Patula vicaria and *P. radicalis*, spp. nn., Mousson, *J. de Conch.* xix. pp. 11 & 12, pl. 3. figs. 2 & 3, Tonga I.

Patula gradata (Mouss.): see p. 148.

[*Patula*] *Helix carpetana*, Hidalgo, *Hoj. mal.* 1871, p. 19, allied to *ruderalis* (Stud.), La Granja, Spain; *macquariensis*, Cox, *P. Z. S.* 1871, p. 645, pl. 52. fig. 7, Pt. Macquarie, Australia; *H. (Charopa) subdepressa*, Angas, *ibid.* p. 641, Victoria: spp. nn.

Pity's (Beck, 1837). PEASE, *P. Z. S.* 1871, pp. 451-455, and *J. de Conch.* xviii. pp. 393-397, restores this name for *Endodonta* (Albers, 1850), describing the following spp. nn. from Polynesia:—*atiensis*, Atiu, *rotellina* and *imperforata*, Aitutaki, *roratongensis*, Roratonga, *filocostata* [*sic*], Kauai, *analogica* and *verecunda*, Marquesas. The author reserves the name *Endodonta* for a section of the genus distinguished by its wider umbilicus, and describes as sp. n. of this section *E. celsa*, from Raiatea.

Helix (Pity's) architectonica, *petterdi*, *assimilis*, *subrugosa*, spp. nn., Brazier, *P. Z. S.* 1871, pp. 696 & 697, Tasmania.

[*Endodonta*] *Helix jugosa* (Mighels, 1843) = *rubiginosa* (Gould, 1846); *contorta* (Fér., 1820) = *intercarinata* (Mighels, 1845); *lamellosa* (Fér., 1820) = *fricki* (Pfr., 1858): Pease, *J. de Conch.* xix. pp. 95 & 96.

Helix. European species:—

Carthusiana, *Nummulina*, *Fruticocampylæa*, *Xerocampylæa*, *Levantina*, *Eremophila*, and *Candidula*, new names for subgeneric divisions of *Helix*, with types *H. carthusiana* (Müll.), *nummus* (Ehrenb.), *narzanensis* (Kryn.), *zelebori* (Pfr.), *spiriplana* (Oliv.), *desertorum* (Forsk.), and *candidula* (Stud.), proposed by Kobelt, *Cat. eur. Binnenconch.* pp. 11, 12, 13, 15, 19, & 22.

Helix villosa (Drap.): its occurrence in S. Bavaria, chiefly on the banks of rivers of Alpine origin, is accurately stated by Clessin, *OB. Ver. Regensb.* xxv. no. 10. *H. villosa*, var. *rubra*, *id.* *Nachr. malak. Ges.* iii. p. 127, Bavaria.

Helix concinna, Dup. & M.-Tand., *nec* Jeffr., is renamed *liberta*; it occurs also in Sweden and Denmark: Westerlund, *Faun. moll. Suec.* p. 139.

Helix limnifera (Held. 1836) = *edentula* (Drap., 1805), and is peculiar to the system of the Alps and the Swiss Jura: Martens, *Nachr. malak. Ges.* iii. pp. 197 & 199.

Helix montserratensis, *semipicta*, and *zapateri*, spp. nn., Hidalgo, *J. de Conch.* xviii. pp. 298 & 299, xix. pp. 309 & 311, pl. 12. figs. 4-6, Montserrat, Alcaraz, and Belalcázar, Spain.

Helix gyrenoides, *verticillata*, and *turritella* (Parreyss), Pfeiffer, *Nov. Conch.* iv. pl. 117. figs. 16-24. *H. subcostulata* (Bourg.) is very near *barcinensis* (Bourg.): Hidalgo, *Hoj. mal.* 1871, p. 24. On variability of *H. setubalensis* (Pfr.), *id. ibid.* p. 9.

H. [gr. Campylæa] mællendorfi, sp. n., Kobelt, *Nachr. malak. Ges.* iii. p. 72, Serajevo, Bosnia.

Helix splendida (Drap.) and *carthaginiensis* (Rossm.): for notes on their varr., cf. Hidalgo, l. c. pp. 29 & 6.

For a discussion by the Recorder on the probably hereditary nature, literature, and relative frequency of occurrence of the different combinations of the dark bands in *Helix nemoralis*, *hortensis*, *silvatica*, and *austriaca*, cf. Nachr. malak. Ges. iii. pp. 145-149; some rare varr. are also mentioned by Timmermans, Ann. mäl. Belg. v. p. xx.

Helix nemoralis, var. *trochoides*, and *H. hortensis*, var. *trochoidea*: Clessin, Nachr. malak. Ges. iii. p. 126, Bavaria.—*H. nemoralis*, varr. *marginata* and *porrecta*, *H. hortensis*, var. *perforata*: Westerlund, Exp. crit. pp. 39-41.

Helix arbustorum, var. *trochoidalis* (Rossm.), Clessin, l. c. Bavaria; var. *calcareo* and *conoidea*, Westerlund, l. c. p. 42.

Helix. Species from W. Asia:—

Helix cæsareana (Parr.) and *spiriplana* (Oliv.), *engaddensis* (Bourg.) and *prasinata* (Roth): on the respective affinities of these spp. cf. Martens, Mal. Bl. xviii. pp. 56 & 57-59. *H. krynickii* (Andr.), from Samarcand, *id. ibid.* p. 66, pl. 1. figs. 4 & 5. *H. bicallosa* (Frivaldszky) occurs in the Altai, and its differences from *bidens* (Chemn.) are pointed out, *id. SB. nat. Fr.* 1871, p. 49.

Helix. Species from the E. Indies:—

Helix rueppelli, *arbuscula*, *davidi*, *plicatilis*, *inopinata*, *thibetica*, *alphonssi*, *subechinata*, *bianconii*, and *moupiniana*, spp. nn., Deshayes, N. Arch. Mus. 1871, Moupin, Thibet.

Trachia (Albers). Structure of its shell is nearer *Campylæa* and *Fruticicola* than *Planispira*; the jaw of *T. delibrata* (Bens.) has numerous ribs, and its genital organs are of very simple form; the systematic position of several spp. placed by various authors in this group is discussed; and *T. delibrata* (Bens.) and *gabata* (Gould) are more particularly described: STOLICZKA, J. A. S. B. xl. pp. 224-229, pl. 16. figs. 1-3.

Plectopylis (Bens.). Its conchological and anatomical peculiarities pointed out; oral parts small, intestines long, genital organs rather simple, female part with two appendages; penis external; oviviparous; jaw grooved, thin, with median projection. *P. achatina* (Gray) and *cyclaspis* (Bens.) are more particularly described. *Id. ibid.* pp. 217-223, pl. 15. figs. 1-6.

Helix (Acavus) phoenix (Pfr.): for jaw and lingual dentition, cf. BLAND & BINNEY, Am. J. Conch. vii. p. 180.

Helix leucophthalma (Pfr.), Pfeiffer, Nov. Conch. iv. p. 10, pl. 111. figs. 8 & 9, Celebes.

Helix collis (Mouss.), Amboyna, *semitasa* (Mouss.), Aru I., *embrechtiana* (Mouss.), Moluccas, *cryptopila* (Mouss.), Rakata I., near Java, and *squamulosa* (Mouss.), Java, figured: *id. ibid.* pp. 36-40, pl. 117. figs. 1-3, 4-6, 7-9, 10-12, and 13-15.

Helix thomsoni, *indusiata*, *tukanensis*, and *physalis*, Tukan Besi I., Indian Archipelago, and *H. kobeltiana*, Ceram: spp. nn., Pfeiffer, Mal. Bl. xviii. pp. 119-124.

Helix. African species :—

Helix votiva (Crosse, 1869) figured, J. de Conch. xix. p. 61, pl. 1. fig. 1, Madagascar.

Helix. Species from Japan and China :—

Helix nimbosa and *eo*a (Crosse, 1869), *ibid.* pp. 59 & 60, pl. 2. figs. 1 & 2, Japan [the first ? = *pehionphala* (Fér.), colour var.; the second very near *luchuana* (Sow.)].

Helix callizona, sp. n., Crosse, *ibid.* pp. 227 & 319, pl. 13. fig. 5, Japan.

Helix hainanensis (H. Adams), Pfeiffer, Nov. Conch. iv. p. 9, pl. 111. figs. 5-7, Hainan I.

Helix. Polynesian species :—

[Papuina] *Helix alfredi*, Solomon I., *millicentae*, Louisiades, p. 323, pl. 34. figs. 1 & 2; *guadalcanarensis*, *sellersi*, and *hunteri*, pp. 645 & 646, pl. 52. figs. 8, 9, & 11, Solomon I. : spp. nn., Cox, P. Z. S. 1871.

Helix eustrophes, sp. n., Brown, J. de Conch. xviii. p. 391, Solomon I.

Helix gentilsiana, *gouldardiana*, *vincentina*, *subsidiaris*, and *perroquiniana* (Crosse, 1870) described and figured, J. de Conch. xviii. pp. 403-411, pl. 13. figs. 1-5. *H. multisulcata*, sp. n., Gassies, *ibid.* p. 300 : several varieties of it described by Crosse, *ibid.* pp. 408 & 409. *H. abax* (Marie, 1870) described and figured by Marie, *ibid.* p. 420, pl. 13. fig. 6. *H. rossiteriana*, Crosse, l. c. xix. p. 202; *vaysseti*, Marie, *ibid.* pp. 325-328 (allied to *H. mariei* and *cabriti*); *morosula*, *conceptionis*, *lamberti*, and *decreta*, Gassies, Act. Soc. L. Bord. xxviii. pp. 48, 53, 54, 180 : spp. nn., all from N. Caledonia.

H. [Hadra] compluviatus [sic], sp. n., Cox, P. Z. S. 1871, p. 646, pl. 52. fig. 10, Solomon I.

Helix. Australian species (all spp. nn.) :—

H. (Hygromia) bednalli, Brazier, P. Z. S. 1871, p. 641, S. Australia.

H. (Trachia) endeavourensis, *id. ibid.* p. 640, Australia.

H. (Hadra) darwini, N. Australia, *stephensoniana* and *bennetti*, Queensland : *id. ibid.* p. 639.

H. (Camena) aureedensis, *id. ibid.* p. 640, Torres Straits.

[*Hadra*] *Helix gratiosa*, *cozeni*, *sardalabiata [sic]*, *ocnelliensis*, *whartoni*, Cox, P. Z. S. 1871, pp. 53-55, pl. 3. figs. 1-5, Queensland.

Helix bellengerensis, *id. ibid.* p. 54, Bellenger, N. S. Wales; *bellengerensis [sic]*, Brazier, l. c. p. 321, N. S. Wales; *andersoni*, Queensland, *scandens*, Pt. Macquarie, *kempseyensis*, E. Kempsey, E. Australia, Cox, l. c. p. 645, pl. 52. figs. 4, 5 & 6.

Helix. N.-American species :—

COOPER (Am. J. Conch. v. pp. 199-219) publishes remarks on land-snails of the west coast.

Helix newberryana (Binn.), in jaw and lingual dentition, resembles true *Helix* : Bland & Binney, Am. J. Conch. vii. pp. 190 & 191, pl. 6. figs. 3 & 4.

H. (Gonostoma) yatesi (Cooper, nec Pfr.), and *H. (Polygyra) fastigians* (Say) : jaw and lingual dentition, *id. ibid.* p. 176.

Dædalochilu harfordiana, sp. n., Cooper, *l. c.* p. 196, pl. 17. fig. 8, California.

Lysinoe (H. & A. Adams) and *Arionta* (Leach). The Californian spp. are distributed between these two divisions, regarded as distinct genera: *id. ibid.* pp. 200-210.

Helix (*Arionta*) *reticulata* (Pfr.) and *nickliniana* (Lea): jaw and lingual dentition, Bland & Binney, *ibid.* vii. p. 177.

Helix ptychephora, sp. n., Brown, J. de Conch. xviii. p. 392, Bitter-Root Mountains and Nebraska.

Helix. Species from Tropical America:—

BLAND & BINNEY, Am. J. Conch. vii., give the lingual dentition of the following species:—*H. (Dorcasia) similis* (Fér.), Rio Janeiro (and jaw), p. 176; *H. (Coryda) gossii* (Ad.), *H. (Thelidomus) notabilis* (Shuttl.), *H. (Cysticopsis) pemphigodes* (Pfr.), p. 177; *H. (Plagioptycha) loxodon* (Pfr.), *diaphana* (Lam.), and *monodonta* (Lea), and jaw, *ibid.* and p. 178; *H. (Polymita) graminicola* (Ad.), *variens* (Pfr.), and *muscarum* (Lea), and jaw, p. 178; *H. (Eurycratera) crispata* (Pfr.), *H. (Dentellaria) isabella* (Pfr.) and *dentiens* (Fér.), and jaw, *H. (Pleurodonta) schroeteriana* (Pfr.), p. 179; *H. (Caracolus) excellens* (Pfr.), and *H. (Leptotoma) fuscocincta* (Adams), p. 180.

Helix rhynchæna, Brown, J. de Conch. xviii. p. 392, and *vendryesiana*, Gloÿne, *ibid.* xix. p. 333, spp. nn., Jamaica.

H. (Polygyra) hundi, sp. n., Mörch, Mal. Bl. xviii. p. 38, Lappa da Pedro, Brazil.

Helix ortonii and *napensis*, spp. nn., Crosse, J. de Conch. xix. pp. 227 & 228, 313 & 314, pl. 13. figs. 2 & 1, Ecuador; the former allied to *H. heligmoidea* (Orb.), the second belonging to the group *Solaropsis*.

Anostoma globulosum (Lam.), jaw, radula, and subœsophageal ganglions described and figured by FISCHER, *ibid.* pp. 261-263, pl. 11. The jaw resembles that of *Strophia*.

Cochlostyla fulgetrum (Brod.): jaw and lingual dentition, BLAND & BINNEY, *l. c.* p. 180.

FISCHER, *l. c.* pp. 166-170, for anatomical reasons, proposes the following arrangement of the shells hitherto generally united in the genus *Bulinus*:—

1. *Bulinus*, type (jaw pectinated), with subgenera *Borus*, *Bulimulus*, *Limicolaria*, *Achatina*, and *Cochlicellus*. Must be placed near *Helix*.

2. "*Bulinus* of the group of *Pupa*" (jaw finely striate), confined to the Old World, and mostly European spp., to form a separate genus *Buliminus*, and be placed with *Pupa*, *Clausilia*, *Vertigo*, *Chondrus*, and *Eucalodium*, in the family *Pupidae*.

3. "*Bulinus* of the group of *Orthalicus*" (ribs of the jaw

meeting in the middle at acute angles). Several Mexican and S.-American spp., also those now comprised in the groups *Orthalicus* and *Placostylus*, together forming, with the genus *Lignus*, the family *Orthalicidae*. All American except *Placostylus*.

4. *Bulimus* with compound maxilla, as yet too little known to be classified.

[This arrangement coincides essentially with that proposed, from the original researches of Troschel, by the Recorder in Albers's "Heliceen," ed. 2, and followed hitherto in Zool. Rec., with the additions and corrections which since that publication have resulted from the researches of various observers. The second division is not wholly confined to the Old World, but occurs also in North and Central America.]

Bulimus oblongus, Müll., var. *alba*, *pardalis* (Fér.), and *marmoratus* (Dunker): for jaw and lingual dentition, cf. Bland & Binney, l. c. pp. 180 & 181.

Bulimus heerianus, *teysmanni*, *purus*, *appressus*, and *andamensis* (Mousson) are figured in Pfeiffer's Nov. Conch. iv. pp. 31-35, pl. 116. figs. 1, 2 & 3, 6, 4 & 5, and 7-10. The first two are said to be from the Moluccas, and seem scarcely distinct from *winteri* (Pfr.); the two following are from Java; and the last, from the Andaman I., seems scarcely distinct from *inversus* (Müll.).

Placostylus. *Bulimus porphyrostomus* (Pfr.) and *scarabus* (Albers) have been anatomically investigated by FISCHER (l. c. pp. 161-166, pl. 7). Their jaw is much arched, with oblique ribs, meeting in the centre under an acute angle, as in the *Gonio-gnatha*; the teeth of the radula are similar to those of true *Bulimus* and *Helix*; the sagitta, multifid vesicles, and flagellum are absent; the genital apparatus is limited to the most essential organs.

The large New-Caledonian spp. are thus arranged by Gassies, Act. Soc. L. Bord. xxviii. pp. 56-92:—

1. *PLACOSTYLUS* (Beck).

a. *B. fibratus* (Mart.), *buccalis* and *pinicola* (Gass.), *boutariensis* (Souv.), *insignis* (Pet.), *ouveau* (Dotz.), *edwardsianus* and *infundibulum* (Gass.), *duplex*, sp. n. p. 64, *similis*, *ouensis*, and *lamberti* (Gass.).

b. *B. souvillii* (Morelet), *cicatricosus*, new name for the var. *kanalensis* (Crosse) of *souvillii*, *alexander* (Crosse), *guestieri* (Gass.), and *goroensis* (Souv.).

c. *B. porphyrostomus* (Pfr.), *caledonicus* (Pet.), *mariei* (Crosse), *submarici* (Souv.), *pseudocaledonicus* (Montr.), *scarabus* (Alb.), *annibal* (Souv.), *bondeensis* (Cr. & Souv.), *biviricosus* (Gask.), *aeopeus* and *infundibulum*, spp. nn., pp. 86 & 87.

2. *CHARIS* (Albers).

d. *B. eddystonensis* (Reeve), *bavayi* (Crosse), *rhizophorarum*, correction for *paletuvianus* (Gass.), and *pancheri* (Crosse).

Bulinus debeauci, *lalannei*, *imbricatus*, *turgidulus*, *alboroseus*, *superfusiatus*, *patens*, *fulcicula*, *necouensis*, *carbonarius*, *abbreviatus*, and *bulbulus*, spp. nn., id. *ibid.* pp. 184-193, all from New Caledonia.

Placostylus. Marie discusses the general and specific characters, poly-

morphism, localities, habits, eggs (5 mill. in *B. porphyrostomus*), and use to man as food, of the New-Caledonian spp. : J. de Conch. xviii. pp. 381-391.

Varr. of *Bulimus fibratus*, *souvillii*, *alexander*, and *pseudocaledonicus* are described by Crosse, *ibid.* pp. 412-416.

[*Placostylus*] *Bulimus kantaruensis* (Crosse, 1870), *ibid.* xix. p. 105, pl. 5. fig. 3, Fiji I.

[*P.*] *Bulimus hargravesi* and *sellersi*, spp. nn., Cox, P. Z. S. 1871, pp. 323 & 644, pl. 34. fig. 3, and pl. 52. fig. 3, Solomon I.

Draparnaudia, Montrouzier, name for a subdivision of *Bulimus*, containing *B. sinistrorsus* (Desh.) and *theobaldianus* (Gassies) : Act. Soc. L. Bord. xxviii. p. 57.

Limicolaria numidica (Reeve), jaw : BLAND & BINNEY, Am. J. Conch. vii. p. 181.

Limicolaria flammea (Müll.), Pfeiffer, Nov. Conch. iv. p. 21, pl. 113. figs. 5 & 6.

Pseudachatina wrighti (Sow.), *id. ibid.* p. 20, pl. 113. figs. 1-4.

Bulimus pancheri (Crosse, 1870) described and figured, J. de Conch. xviii. p. 411, pl. 13. fig. 7. *B. mageri* (Gassies) distinguished from *zonulatus* (Pfr.), and varr. described by Crosse, *ibid.* pp. 416 & 417.

Bulimus (Liparus) brazieri, Angas, P. Z. S. 1871, p. 19, pl. 1. fig. 28, King George's Sound, Australia ; *keeshawi*, Brazier, *ibid.* p. 641, Victoria : spp. nn.

Bulimus larreyi, sp. n., *id. ibid.* p. 321, N. S. Wales.

[*Buliminus*] *Bulimus astierianus* (Dupuy), allied to *obscurus* (Müll.), found near Namur : Broeck, Ann. Mal. Belg. v. pp. 45 & 46.

Buliminus labrosus (Oliv.) found beyond the valley of the Jordan by Kiepert : Martens, Mal. Bl. xviii. p. 58. *B. montanus* (Drap.), var. *major* (Rossm.) : Clessin, Nachr. malak. Ges. iii. p. 127, Bavaria. *B. obscurus* (Müll.), var. *oblongus* : Westerlund, Expos. crit. p. 62.

[*Buliminus*?] *Bulimus davidi*, *baudoni*, *moupiniensis*, and *macroceramiformis*, spp. nn., Deshayes, N. Arch. Mus. 1871, Moupin, Thibet.

Carelia variabilis, sp. n., and *C. adusta* (Gould), var. *n. angulata*, Pease, J. de Conch. xvii. p. 403, Hawaiian I.

Partula pellucida, sp. n., and *faba*, var. *n. subangulata*, both from Tahaa, Solomon I., *id.* P. Z. S. 1871, pp. 457 & 458, and J. de Conch. xviii. p. 401 ; *P. assimilis*, var. *n. virgulata*, Roratonga, *id. ibid.* ; *P. arguta* (*Bulimus*, Pease), Martens & Langkavel, Don. Bism. p. 55, pl. 3. fig. 7, Tahiti.

Partula subgonochila, Mousson, J. de Conch. xix. p. 14, pl. 3. fig. 4, Futuna, Tonga I. ; *peasii*, Cox, P. Z. S. 1871, p. 644, pl. 52. fig. 2, Solomon I. ; *brazieri*, Pease, Am. J. Conch. vii. p. 27, pl. 8. fig. 5, Tutuila I. : spp. nn.

Tornatellina bacillaris, sp. n., Mousson, *l. c.* p. 16, pl. 3. fig. 6, Futuna.

Tornatellina noumeensis (Crosse, 1870), *ibid.* p. 193, pl. 6. fig. 4, N. Caledonia.

Cochlicopa minima (Siemaschko) = *collina* (Drouet), Sweden : Westerlund, Expos. crit. p. 64.

Cæcilianella gredleri, sp. n., Trient, compared with *acicula*, *aciculoides*, and *veneta* : Küster, Ber. Ges. Bamb. ix. pp. 91-94.

Stenogyra decollata (L.), *gonostoma* (Gundl.), and *octona* (Chemn.), lingual dentition : BLAND & BINNEY, Am. J. Conch. vii. p. 183.

Balea sarsi (Phil.) appears to be only a younger state of *Clausilia ni-*

gricans (Jeffr.): Westerlund, Faun. moll. Suec. pp. 230 & 231; Exp. crit. p. 81.

Clausilia. The following Swedish spp. are enumerated by Westerlund (*l. c.* pp. 187-224; Exp. crit. pp. 66-78):—*C. laminata* (Müll.) and *plicifera* and *propinqua*, varr. nn.; *nilssoni*, sp. n., = *papillaris*, Nilsson, *nec* Müll. (not seen by the author); *biplicata* (Mont.); *plicata* (Drap.), with varr. *implicata* and *austera*; *ventricosa* (Drap.), with varr. *tumida* and *gracilis*; *rolphi* (Leach); *plicatula* (Drap.), and *fallaciosa* and *leucostoma*, varr. nn.; *æmula*, *scanica*, and *oreas*, spp. nn.; *pumila* (Ziegl.); *sejuncta* (A. Schmidt); *ommæ*, *connectens*, and *personata*, spp. nn.; *parvula* (Stud.); *bidentata* (Ström) = *nigricans* (Pult., Pfr.), and *exigua*, *erronea*, and *subrugosa*, varr. nn.

Clausilia cuspidata (Held) = *cruciata* (Stud.); *C. corynodes* (Held, 1836) = *gracilis* (Rossmass., 1838, *nec* C. Pfeiffer): Clessin, Nachr. malak. Ges. iii. pp. 136 & 137.

Clausilia sieversi, Pfeiffer, Mal. Bl. xviii. p. 70, S. Caucasia; *thibetiana*, *serrata*, and *gibbosula*, Deshayes, N. Arch. Mus. 1871, Moupin, Thibet: spp. nn.

Clausilia (*Phædusa*) *philippiana* (Pfr.): shell, living animal, and anatomy (the latter agreeing with that of the common *Helicidæ*, the species representing a small peculiar group of "Vespi-form" *Clausiliæ*), STOLICZKA, J. A. S. B. xl. pp. 174-177, pl. 6. figs. 7-10.

Clausilia japonica, sp. n., Crosse, J. de Conch. xix. pp. 228 & 320, pl. 13. fig. 5, Japan.

Clausilia tridens (Chemn.): jaw and lingual dentition described and figured by BLAND & BINNEY, Am. J. Conch. vii. p. 28, pl. 2.

Pupa monodon (Held, 1837) = *schranksi* (Roth, 1856) = *striata* (Gredler, 1856), S. Bavaria; lower tentacles wanting, as in *Vertigo*: Reinhardt, Nachr. malak. Ges. iii. pp. 185-190. For observations on *P. uniarmata* (Küster), from Trieste, cf. Küster, Ber. Ges. Bamb. ix. p. 99.

Pupa caspia, sp. n., Pfeiffer, Mal. Bl. xviii. p. 70, S. Caucasia.

Pupa lignicola, sp. n., Stoliczka, *l. c.* p. 171, Moulmein.

Pupa moreleti, sp. n., Brown, J. de Conch. xviii. p. 393, Labuan I.

Pupa obstructa and *lifouana*, Gassies, Act. Soc. L. Bord. xxviii. pp. 97 & 98; *mariei*, Crosse, J. de Conch. xix. p. 202: spp. nn., New Caledonia.

[*Vertigo*] *Pupa liljeborgi*, *ronnebyensis*, *ovoidea*, *pineticola*, *tumida*, *collina*, and *otostoma*, spp. nn., Sweden (the 3 last sinistral), and several varr. nn. of known spp.: Westerlund, Faun. moll. Suec. pp. 262-276, Exp. crit. pp. 90-100.

Vertigo tridentata, sp. n., Wolf, Am. J. Conch. v. p. 198, pl. 17. fig. 1, N. America.

Vertigo striatula, *costata*, *costulosa*, and *bacca*, Hawaii; *armata*, Bolabola; *simplicaria*, Marquesas; *perlonga*, Oahu; *dentifera*, Roratonga: spp. nn., Pease, P. Z. S. 1871, pp. 461 & 462.

Hypselostoma tubiferum (Bens.). The living animal observed by STOLICZKA. Eye-peduncles rather elongate; shell carried in a reverse position. *L. c.* p. 173, pl. 7. fig. 1.

H. dayanum, sp. n., *id. ibid.* p. 172, pl. 7. fig. 2, Moulmein.

GONIOGNATHA (ORTHALICIDÆ).

Bulimulus alternatus (Say), *membranaceus* (Phil.), *jonasi* and *berendti* (Pfr.), and *durus* (Spix). Jaw apparently composed of numerous separate plates; lingual dentition described with that of *B. aureolus* (Guppy), var. *rawsoni*. BLAND & BINNEY, Am. J. Conch. vii. pp. 181 & 182.

[*Bulimulus*] *Bulimus pluto* and *prometheus* (Crosse, 1869), J. de Conch. xix. pp. 62 & 63, pl. 2. figs. 2 & 3, Peru.

[*B.*] *Bulimus kuehnholtzianus*, Crosse, *ibid.* xviii. p. 301, xix. p. 64, pl. 4. fig. 3, Montevideo; *ucayalensis*, *id. ibid.* xix. pp. 229 & 317, pl. 13. fig. 4, banks of R. Ucayali, Ecuador: spp. nn.

[*B.*] *Bulimus sufflatus* (Gould, 1859) = *juarezi* (Pfr. 1865): *id. ibid.* p. 207.

Macroceramus gossei, Pfr. Jaw (but not lingual dentition) resembles that of *Cylindrella*. BLAND & BINNEY, Am. J. Conch. vii. p. 187, pl. 17. fig. 9.

Cylindrella subula (Fér.) and *seminuda* (C. B. Adams). Lingual dentition resembles that of *gracilis*: *id. ibid.* pp. 183 & 184.

Cylindrella (*Leia*) *dohrmiana*, sp. n., Pfeiffer, Mal. Bl. xviii. p. 119, Jamaica.

Pineria viequensis (Pfr.) = *schrammi* (Fischer). Jaw resembles that of *Cylindrella* and *Macroceramus*; entire, but apparently divided perpendicularly into about 28 curved sections or folds; 2 lateral and several additional rudimentary marginal teeth in a row on each side of the radula. BLAND & BINNEY, Ann. Lyc. N. York, x. pp. 22-27.

ELASMOGNATHA.

Succinea oblonga (Drap.). Records of its habitats are collected, and the conclusion drawn that it often lives in very dry spots, and also on tree-trunks. Kobelt, Nachr. malak. Ges. iii. pp. 49-54.

Succinea altaica, Martens, SB. nat. Fr. 1871, p. 50, Altai; *temporalis*, Westerlund, Faun. moll. Suec. p. 286, Exp. crit. p. 103, Sweden (nearly allied to *putris*, L.); *fischeri*, Gassies, Act. Soc. L. Bord. xxviii. p. 15, New Caledonia; *mammillata* and *rubella*, Pease, P. Z. S. 1871, p. 459, Nukahiwa and Lauai: spp. nn.

Succinea sagra (Orb.): jaw and lingual dentition, BINNEY & BLAND, Am. J. Conch. vii. p. 184.

Amphibulima patula (Brug.): lingual dentition, *id. ibid.* p. 186, pl. 17. figs. 1 & 2.

Succinea (*Lithotis*) *rupicola* and *tumida* (Blanford), Pfeiffer, Nov. Conch. iv. pp. 11 & 12, pl. 112. figs. 1-4 & 5-7, British India.

Catinella, g. n. Shell planulate, fragile, spire rudimentary; habits arboreal. Types *C. (Succinea) rubida* (Pease) and *explanata* (Gould). Pease, P. Z. S. 1871, p. 459.

Truella, g. n. Shell elongate, slender; aperture contracted behind. Types *T. (Succinea) elongata* (Pease), *procera* (Gould), and *infundibuliformis* (Gould). *Id. ibid.*

LIMNOPHILA.

AURICULIDÆ.

Pythia tortuosa, sp. n., Mousson, J. de Conch. xix. p. 19, pl. 3. fig. 6, Tonga I.

Melampus cassidulus (Gass., 1867) is renamed *Cassidula balteata*: Gassies, Act. Soc. L. Bord. xxviii. p. 120.

Plecotrema striatum (Phil.) and *clausum* (A. Ad.), Sandwich I., described by Pease, P. Z. S. 1871, p. 468. *P. mordax* (Dohrn), Martens & Langkavel, Don. Bism. p. 55, pl. 3. fig. 8, Paumotu I.

Melampus ornatus and *tongaensis*, Mousson, J. de Conch. xix. pp. 21 & 22, pl. 3. figs. 7 & 8, Tonga I.; *leai*, Gassies, Act. Soc. L. Bord. xxviii. p. 116, New Caledonia: spp. nn.

Melampus mucronatus (Gould, 1849) = *oryza* (H. & A. Adams, 1854): Pease, P. Z. S. 1871, p. 470. *M. castaneus* (Mhlfd.), *parvulus* (Nuttall), *caffer* (Küst.), and *teniola* (Hombr. & Jacq.), Martens & Langkavel, l. c. p. 56, pl. 3. figs. 9-12, Polynesian I.; and on variability of *luteus* (Quoy & G.), *id. ibid.* p. 55.

Læmodonta conica (Pease, 1862) = *annaensis* (Mouss., 1869): Pease, P. Z. S. 1871, p. 479, and J. de Conch. xix. p. 94; figured by Martens & Langkavel, l. c. p. 57, pl. 3. fig. 13, Paumotu I.

LIMNÆIDÆ.

Limnæa stagnalis (L.). The numerous varr. of this sp. are treated by Kobelt (Mal. Bl. xviii. pp. 108-119, pls. 2 & 3) in a similar way to his discussion of *L. auricularia* (cf. Zool. Rec. vii. p. 164), with reference to the various qualities of water and ground in and on which it is found. The forms regarded as distinct spp. by Bourguignat, Parreyss, and Ziegler, and the N.-American *jugularis* (Say) are judiciously reunited to *stagnalis* as local varr.

Limnæa appressa (Say), from Lake Champlain (? specifically distinct from the European *stagnalis*), and *L. megasoma* (Say): lingual dentition described and figured by Bland & Binney, Am. J. Conch. vii. p. 161, pl. 12.

Limnæa peregra, var. *cærulea*, Clessin, Nachr. malak. Ges. iii. p. 127, Bavaria. *L. maritima* (Jeffr. ?), Westerlund, Exp. crit. p. 110, Sweden.

Limnæa fluminensis, sp. n., *ventricosa*, and *ampla* (Hartm.), allied to *auricularia* (L.), comparatively described from specimens living in pools on the banks of the Danube in Bavaria: Clessin, CB. Ver. Regensb. xxv. no. 10.

Limnæa lagotis (Schr., 1803) = *acuta* (Jeffr., 1833) = *vulgaris* (Rossm. pt., Kobelt, nec Pfr.): Martens, Nachr. malak. Ges. iii. pp. 121-123.

Limnæa davidi, Deshayes, N. Arch. Mus. 1871, Thibet; *tazewelliana*, Wolf, Am. J. Conch. v. p. 198, pl. 17. fig. 2, N. America: spp. nn.

Pompholyx effusa (Lea), lingual dentition: Bland & Binney, Am. J. Conch. vii. pp. 312 & 313, pl. 19.

Physa capillata, Gassies, Act. Soc. L. Bord. xxiv. p. 987, and J. de Conch. xviii. pp. 306 & 307 (with long soft hairs in suture), Crete; *P. semiglobosa*, Westerlund, Exp. crit. p. 120, Sweden; *P. varicosa*, Gassies, Act. Soc. L. Bord. xxviii. p. 197, New Caledonia: spp. nn.

Physa tongana (Quoy) redescribed by Mousson, J. de Conch. xix. p. 18.

Planorbis ammonoceras, *goesi*, *dispar*, *gothicus* and *malmi*, pp. 124–136, Sweden; *cavatus*, p. 133, Lake of Constance, Westerlund, *l. c.*; *P. thibetanus*, Deshayes, N. Arch. Mus. 1871, Thibet; *P. rossiteri*, Crosse, J. de Conch. xxi. p. 204, New Caledonia: spp. nn.

Planorbis sudanicus (Martens), Pfeiffer, Nov. Conch. iv. p. 23, pl. 114. figs. 6–9, Bahr-el-gazal. *P. raymondi* and *trigyrus* (Phil.), *id. ibid.* pp. 24 & 25, figs. 13–16, 17 & 18, Peru.

Ancylus fluviatilis (Müll.), var. n., Broeck, Ann. Mal. Belg. v. p. 56, Belgium.

Ancylus textilis, Guppy, Am. J. Conch. vii. p. 311, Trinidad; *A. noumeensis*, Crosse, *l. c.* p. 203, New Caledonia: spp. nn.

THALASSOPHILA.

SIPHONARIIDÆ.

Siphonaria atra (Q. & G.) = *coreensis* (A. Ad.), and *S. cochleariformis* (Reeve), from Nagasaki: Lischke, Jap. Meeres-Conch. ii. pp. 105 & 106.

PULMONATA OPERCULATA.

CYCLOPHORIDÆ (CYCLOTACEA).

Cyclotus sieversi, sp. n., Pfeiffer, Mal. Bl. xviii. p. 69, S. Caucasia.

Pterocyclus ater, sp. n., Stoliczka, J. A. S. B. xl. p. 149, pl. 6. fig. 2, Moulmein.

Pterocyclus? *endædaleus* (Crosse, 1869), J. de Conch. xix. p. 67, pl. 1. fig. 2, Borneo [probably = *sumatranus*, v. Martens].

Cyclophorus (*Myxostoma*) *inglisianus*, sp. n., Stoliczka, *l. c.* p. 148, pl. 6. fig. 1, Moulmein.

Leptopoma trochus (Dohrn), Pfeiffer, Nov. Conch. iv. p. 13, pl. 112. figs. 8–10, Mindanao.

Dacrystoma, g. n. Testa vix perforata, oblongo-turrita, solidula, striata, epidermide tenui induta; anfr. sat numerosi; apertura angulato-ovalis; peristoma vix brevissime solutum, continuum, incrassatum, reflexum, margine basali protracto. Operculum ignotum. *D. arboreum*, sp. n., Crosse & Fischer, J. de Conch. xix. p. 332, Madagascar (on trees).

PUPINIDÆ.

Hyalopsis, g. n. Testa pupiformis, callo nitido obducta; peristoma simplex, vix incrassatum, margine columellari integro, canali verticali ad insertionem marginis dextræ. *H. tumida*, sp. n., Pease, Am. J. Conch. vii. p. 27, pl. 9. fig. 6, Tutuila I.

Pupina adamsiana, sp. n., Crosse, J. de Conch. xix. p. 330, Vanua-Levu, Fiji I.

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Registoma brazieri (Crosse, 1870), J. de Conch. xix. p. 321, pl. 13. fig. 6, N. Hebrides.

DIPLOMMATINIDÆ.

Diplommata (Bens.). Stoliczka criticizes the recent separation as genera or subgenera of *Palaina*, *Moussonia*, *Diancta*, *Paxillus*, and *Nicida*, all of which he considers not to differ essentially from *Diplommata*. J. A. S. B. xl. pp. 153-157.

Diplommata carneola and *D. (Palaina) crispata*, *id. ibid.* pp. 152 & 153, pl. 6. figs. 3 & 4, Moulmein; *D. perroquini*, Crosse, l. c. p. 204, New Caledonia, spp. nn.

Palaina (Semper, 1865) = *Peupoidea* (Pease, 1865): operculum membranaceous, circular, multispiral. Pease, P. Z. S. 1871, p. 465.

Alycæus sculptilis (Bens.), *caroli* (Semper), Luzon, *otiphorus* (Bens.), Himalaya, and *distortus* (Haines), Siam: Pfeiffer, Nov. Conch. iv. pp. 17-19, pl. 112. figs. 20-33.

CYCLOSTOMIDÆ.

Atropis (*Omphalotropis*, subg. n.). Shell elongate, obtusely angulate. Types *O. viridescens* (Pease) and *ventricosa* (Hombr. & Jacq.), Pease, l. c. p. 463.

Cyclomorpha, g. n. Shell smooth or spirally striated, subturbinate or subglobose, resembling in form that of the *Cyclophoridae*; operculum paucispiral, as in *Omphalotropis*. Type, *Cyclostoma flavum* (Brod.), Pease, l. c. p. 464. To this genus belongs probably also *Cyclophorus* (*Ostodes*) *biangulatus* (Pease): Martens & Langkavel, Don. Bism. p. 58, pl. 3. fig. 16, Hervey I.

Realia huaheinensis (Pfr.), *variabilis* and *ochrostoma* (Pease), and *vescoi* (Dohrn), *id. l. c.* pp. 58 & 59, pl. 3. figs. 17-20, Polynesia.

Omphalotropis vallata (Gould) and *imperfecta*, var. n., Mousson, J. de Conch. xix. p. 28, Tonga I.

Omphalotropis elongata (*Realia*, Pease, 1867), *raiatensis* (*Hydrocena*, Mouss., 1869): Pease, *ibid.* p. 95. Pease adds some remarks to his former monograph of this genus, *ibid.* p. 97.

Sculinella tahitensis (Pease), Martens & Langkavel, l. c. p. 59, pl. 4. fig. 3.

Pomatias himalayanus (Bens.), *croaticus* (Zeheb.), and *dalmatinus* (Parr.): Pfeiffer, Nov. Conch. iv. pp. 14-16, pl. 112, figs. 11 & 13, 14 & 18, 17 & 19.

TRUNCATELLIDÆ.

Truncatella futunaensis, sp. n., Mousson, J. de Conch. xix. p. 30, Futuna, Tonga I.

Truncatella cristata (Crosse), redescribed, *ibid.* p. 66, and figured pl. 3. fig. 11, also from Tonga.

Taheitia (A. Ad.) differs only in its operculum from *Truncatella*, and some transposition of spp. is necessary in these genera. *T. scalariformis* (Reeve, 1842) = *a.cticostata* (Mouss., 1869); *T. concinna*, Kingsmill I., and *costellifera*, Vaini, spp. nn., Pease, P. Z. S. 1871, p. 468, and J. de Conch. xix. pp. 91 & 96.

Taheitia scalariformis (Reeve) and *pallida* (Pease), Martens & Langkavel, *l. c.* p. 60, pl. 4. figs. 1 & 2, Tahiti and Huaheine.

Blanfordia ? *viridescens* (*Cyclostoma*, Pease), *iid. ibid.* pl. 3. fig. 21, Tahiti.

Geomelania (Pfr.), lingual dentition, BLAND and BINNEY, *Am. J. Conch.* vii. p. 185, pl. 17. figs. 7, 10-12.

Blandiella (Guppy, *ibid.* vi. p. 309) : lingual dentition (again described) resembles that of *Truncatella* and the fluviatile *Rissoidæ*; *iid. ibid.* fig. 5.

ASSIMINEÆ.

Assiminea nitida and *fragilis* (*Hydrocena*, Pease), Huaheine and Ascension, in the Pacific; Martens & Langkavel, *l. c.* p. 61: the former figured pl. 4. fig. 4.

HELICINIDÆ.

Helicina occulta (Say) : lingual dentition redescribed by BLAND and BINNEY, *l. c.* pp. 29 & 30, pl. 2. fig. 6.

Helicina ucana and *culminans*, spp. nn., Mousson, *J. de Conch.* xix. pp. 24 & 26, pl. 3. figs. 9 & 10; *H. fulgora* (Gould), var. *diminuta*, *id. ibid.* p. 25: all from Tonga I.

Helicina miltochila (Crosse, 1869), *J. de Conch.* xix. p. 65, pl. 2. fig. 5, Pacific Islands.

Helicina colorata (Pease, 1868) = *annaensis* (Mouss., 1869) : Pease, *ibid.* p. 94.

Helicina porphyrostoma, *lata*, *mouensis*, *benigna* (Crosse, 1870), *ibid.* pp. 194-198, pl. 6. figs. 6, 8, 5, 7, New Caledonia.

Helicina jana, sp. n., Cox, *P. Z. S.* 1871, p. 647, pl. 52. fig. 13, Pt. Macquarie, Australia.

Helicina tectiformis (Mouss., 1870) = *mangoensis* (Sow., 1870); *H. norfolkensis* (Pfr.) = *plicatilis* (Mouss., 1865), the latter from Upolu, not from Norfolk I.: Brazier, *P. Z. S.* 1871, p. 322.

Helicina brazieri, sp. n., Pease, *l. c.* xviii. p. 397, Niue I., Polynesia.

Helicina mariei (Crosse, 1870), described and figured, *ibid.* p. 418, pl. 13. fig. 9.

Helicina maugeriæ (Gray), several varr.; *H. calliostoma*, sp. n., Marquesas; *humilis* (Guppy, preoccupied), renamed *guppyi*; *colorata* (Pease, 1868) = *annaensis* (Mouss., 1869); *flavescens* (Pease, 1867) = *pacifica* (*id.* 1865) : Pease, *P. Z. S.* 1871, pp. 466 & 467.

Helicina maugeriæ, var. *rubicunda* (Pease), *miniata* (Less.), and *solida* (Pease), from Raiatea, Bolabola, and Tahiti, figured by Martens & Langkavel, *l. c.* p. 60, pl. 3. figs. 22-24.

Helicina viridis (Lam.) stated to have been again found in Hayti by Newcomb: Crosse, *J. de Conch.* xix. p. 380. [Crosse seems not to be aware that it has been recognized in the Haytian *versicolor* (Pfr.) by the Recorder and Pfeiffer himself, *Mal. Bl.* xii. (1865), pp. 174-176.]

Stoastoma pisum (C. B. Ad.) : lingual dentition resembles that of *Helicina*. BLAND and BINNEY, *Am. J. Conch.* vii. p. 184.

Hydrocena turbinata, sp. n., Gassies, Act. Soc. L. Bord. xxviii. p. 195, New Caledonia.

Georissa liratula and *blanfordiana*, spp. nn., Stoliczka, J. A. S. B. xl. pp. 157 & 158, pl. 6. figs. 5 & 6, Moulmein.

Chondrella, g. n. No tentacles, eyes immersed in the head; shell globose-conic, aperture roundish, peristoma simple, not connected; columella with a callosity. Types, *C. (Cyclostoma) parvum* (Pease) and *minutissimum* (Sow.), Pease, P. Z. S. 1871, p. 465. *Ch. striata*, sp. n., Roratonga, *id. ibid.* p. 477.

SOLENOCONCHÆ.

Dentalium subtorquatum, sp. n., Fischer, J. de Conch. xix. p. 218, Suez.

LAMELLIBRANCHIATA.

RÉCLUZ (Act. Soc. L. Bord. xxvii. pp. 29-34) proposes the following classification:—

Subclass DIMYARIA.

Order DISIPHONIPHORA.

Suborder *Scoliephora*.

Tribe Crateromonaria.

Section. Ligament absent or external. Families: Aspergillidæ, Pholadidæ, Gastrochænidæ, Solenidæ, Panopidæ, Glycimeridæ.

Section. Lig. internal.

Subsection. Inequivalve. Families: Ceromydæ, Myadæ, Pandoridæ, Anatinidæ.

Subsection. Equivalve. Families: Mactradæ, Amphidesmidæ.

Tribe Craterodimaria.

Section. Lig. int. Families: Lavignonidæ, Mesodesmidæ, Ledidæ.

Section. Lig. ext. Families: Malletiadæ, Tellinidæ, Psammodidæ, Tapesidæ, Veneridæ, Cyrenidæ, Iridinidæ.

Suborder *Ascoliephora*.

Tribe Craterodimaria. Family Eucharidæ.

Tribe Crateromonaria.

Section. Shell regular.

Subsection. Lig. ext. Families: Cycladidæ, Dreissenidæ, Cardiadæ, Tridacnidæ, Lucinidæ, Erycinidæ.

Subsection. Lig. int. Families: Galeommidæ, Solenomyidæ.

Section. Shell irregular. Families: Chamidæ, Rudistidæ.

Order MONOSIPHONOPHORA.

Tribe Craterodimaria. Family Venericardidæ.

Tribe Crateromonaria.

Subsection. Lig. int. Families: Crassatellidæ, Scacchiadæ.

Subsection. Lig. ext. Families: Carditadæ, Ungulinidæ, Mytilidæ, Unionidæ.

Order ASIPHONOPHORA.

Section. Shell reg. Families: Trigoniadæ, Nuculidæ, Arcadæ.

Section. Shell irreg. Family Etheridæ.

Subclass MONOMYARIA.

Tribe. With a foot. Families : Mulleriadæ, Malleidæ, Pectinidæ, Anomiadæ.

Tribe. Apodous. Family Ostreidæ.

The terms *Disiphonophora*, *Monosiphonophora*, and *Asiphonophora* respectively relate to the double or single separate openings or the entire cleavage of the mantle, characters used as a base of systematic arrangement in this class already by Cuvier, in his 'Règne Animal,' 1817, and having no reference to the external union (as in *Mya*), or the distinct nature (as in *Tellina*), of both siphons. The terms *Scoliephora* and *Ascoliephora* answer to the *Sinupalliata* and *Integripalliata* of English conchologists. The distinction of *Crateromonaria* and *Craterodimaria* is new : in the first, the siphons are inserted at the end of the retractor muscles, so as to form a simple prolongation of the mantle ; in the latter, they are inserted in a septum formed by those muscles, and projecting into the pallial cavity, which is thereby divided into two cells. The author disapproves of the distinction of the *Mytilidæ* as a separate subclass, a method indicated by Adanson and adopted by Mörch.

[This classification seems more artificial than natural. As regards the mere names of the families, it is inconsistent to write Anomiadæ, Myadæ, Arcadæ, Carditadæ, and also Ostreidæ, Chamidæ, &c. ; and the Recorder believes the latter method to be the better. The construction, moreover, of Panopidæ and Psammobidæ is wrong, and should be Panopæidæ and Psammobidæ ; Tapesidæ also, should be Tapeidæ.]

STOLICZKA's beautiful work (*Palæontologia Indica*, iii. 1870) on the fossil Bivalves of the cretaceous strata of India, containing a systematic arrangement of all known genera of Bivalves, with their characters, has a direct importance for the student of recent shells ; in it all species hitherto described from the cretaceous strata of all parts of the world are enumerated, those from India being fully described.

INCLUSA.

PHOLADIDÆ.

Xylophaga dorsalis found in floating oak-wood : the living animal verbosely described by Verkrüzen, *Nachr. malak. Ges.* iii. pp. 139-142.

Teredo. Some interesting particulars concerning spp. found on the Danish coasts (among them *Xylophaga stutchburyi*, Leach, in the wood of ships returning from India, described by Spengler as *Teredo navalis*) are given by Mörch, *Vid. Medd.* 1871, p. 202.

Teredo navalis (L.) and *bipennata* (Turton) [the last probably=*pennatifera* (Blainv.)] observed on S.W. coast of France, and their pallets described. Two different spp. may dwell in the same piece of wood. Fischer, *Act. Soc. L. Bord.* xxvii. pp. 83 & 84.

MYIDÆ.

Corbula venusta, Angas, P. Z. S. 1871, p. 20, pl. 1. fig. 29, Pt. Jackson; *C. striata* (nec Montagu) and *lirata*, Smith, *ibid.* pp. 728 & 729, pl. 75. figs. 3 & 2, Wydah: spp. nn.

Corbula rosea (Leach, Brown) = *gibba* (Oliv), var.: Mörch, *l. c.* p. 205.

Neera (*Leptomya*) *pura*, sp. n., Angas, *l. c.* fig. 80, Pt. Jackson.

ANATINIDÆ.

Souleyetia, g. n. Animal unknown. Shell transverse, equivalve, inequilateral, oblong, somewhat gaping behind, without epiderm; summits pointed, small, opposed; hinge linear, with a small oblique spoon-like chondrophore, without cardinal or lateral teeth; ligament cartilaginous, internal; muscular impressions distant, the anterior ovate, the posterior oblong; pallial sinus large, trigonal, deep, truncated obliquely in front. *S. moulinsi*, sp. n., Récluz, Act. Soc. L. Bord. xxvii. pp. 47-49, pl. 3. figs. 10-12, Borneo.

SOLENIIDÆ.

Solen curtus (Des Moulins, Act. Soc. L. Bord. 1832), from Cette, redescribed, refigured, and compared with other species [distinguished chiefly from *S. truncatus* (Sow.) by Des Moulins himself]. *Id.* *l. c.* pp. 63-66, pl. 4. figs. 1-4.

Solen (Siliqua) serresianus, sp. n., *id. ibid.* p. 66, Cette.

Solen gouldii (Conrad) = *gracilis* (Gould, nec Phil.), Lischke, Jap. Meer.-Conch. ii. p. 123, Nagasaki.

Solen subcurvus, Dunker, Mal. Bl. xviii. p. 170, Rockhampton; *S. lappeanus*, *id.* Nov. Conch. p. 129, pl. 44. fig. 1, W. Indies? : spp. nn.

Solen mörchii (Dunker), *id. ibid.* p. 131, fig. 4, locality unknown.

Polia (D'Orbigny, Paléontol. Franç. 1843). This generic name is revindicated also for the recent *Solen legumen* (L.) = *Ceratisolen* (Forbes & Hanl.), and the differences of the recent spp. from the tertiary *P. saucatsensis* (Desmoul.) are pointed out by Desmoulins, Act. Soc. L. Bord. xxviii. pp. 357-371. [The name *Polia* was preoccupied, having been used by Delle Chiaje in 1823 for a genus of Turbellarians, and prior to that in *Lepidoptera* and Botany. There exists a third name for the above genus, *Pharus*, Leach, used in the British Museum as early as 1817, and published in print for the first time about 1840 or 1844.]

Aulus pulchellus (Dunker), Japan, is quite distinct from the young stage of *costatus* (Say): Lischke, *l. c.* p. 124.

Macha quoyi (Desh.) = *cumingiana* (Dunker), seems to be somewhat variable: Martens & Langkavel, Don. Bism. p. 61, pl. 4. fig. 6, Kingsmill I.

Tagelus (Solen) tagal (Adanson) has been fished up with the live animal in Toulon roads by Thorret: Récluz, Act. Soc. L. Bord. xxvii. p. 66.

Siliquaria centralis and *californica* (Conrad), Dunker, Nov. Conch. p. 130, pl. 44. figs. 2 & 3, Georgia and California.

CARDIACEA.

TELLINIDÆ.

Soletellina bæddinghausi (Lischke), Lischke, Jap. Meeres-Conch. ii. p. 118, pl. 9. fig. 9, Nagasaki.

Tellina. Römer commences the monograph of this genus in Küster's continuation of Martini and Chemnitz, sect. 62. 39 spp. are accurately described and figured (pp. 1-64, pls. 1-18), two of which only have not been figured in the works of Sowerby and Reeve, viz. *T. diaphana* (Desh.), Japan, pl. 13. figs. 7-9, and *T. semilævis* (Martens), E. Africa, pl. 18. figs. 1-3.

Tellina prætexta (Martens), *nitidula* (Dunker), and *iridella* (Martens), Lischke, J. M. Conch. ii. pp. 113 & 114, pl. 10. figs. 14, 10 & 11, 8 & 9, Japan.

Tellina pallidula, sp. n., Lischke, Mal. Bl. xviii. p. 42, and J. M.-Conch. ii. p. 114, pl. 10. figs. 6 & 7, Nagasaki.

Tellina nasuta (Conrad), var. = *dissimilis* (Martens), *id. ibid.* p. 115, pl. 10. figs. 15-17, Yokohama; *T. inquinata* (Desh.), var. = *incongrua* (Martens), *id. ibid.* p. 117, figs. 12 & 13, Yokohama and Nagasaki.

Tellina clara, sp. n., Dunker, Mal. Bl. xviii. p. 171, Picador I.

Homala (H. & A. Adams) is renamed *Homalina*, with *Tellina triangularis* (Chemn.) for type, *Homala* (Schum.) being founded on *T. planata* (Gmel.) : Stoliczka, Pal. Ind. iii. sect. vi. p. 118.

Donax dysoni (Desh.), Lischke, Jap. Meeres-Conch. p. 112, Nagasaki and Yokohama.

Scrobicularia. Récluz (Act. Soc. L. Bord. xxvii. pp. 49-55) vindicates for this genus Cuvier's name *Lavignon* (which, however, cannot stand, being French and not Latin), and distinguishes the following spp., all European :—*L. calcinella* (Adanson) = *plana* (Dacosta) = *compressa* (Mont.), Atlantic coast of Africa and Europe; *piperratus* (Belon, Lam.), Mediterranean; *lacteus* (*Amphidesma*, Lam.) = *cottardii* (Payr.), Corsica and Provence, pl. 4. figs. 5-7; *deshayesi*, p. 55, pl. 3. figs. 4-6, Provence, and *moulini*, *ibid.* and figs. 1-3, Languedoc : spp. nn.

MACTRIDÆ.

Macra paulucciæ, sp. n., Aradas & Benoit, Atti Acc. Gioen. (3) v. Syracuse.

Macra spectabilis, sp. n., Lischke, Mal. Bl. xviii. p. 149, and J. M.-Conch. ii. p. 120, pl. 11. figs. 1 & 2, Kiusiu I., Japan.

Macra veneriformis (Desh.), var., *id. ibid.* p. 121, pl. 9. figs. 7 & 8, Yeddo.

Macra (*Trigonella*) *radiata*, Formosa, and *lævis*, Mossel Bay, S. Africa, spp. nn., Dunker, Mal. Bl. xviii. p. 171.

Macra (*Spisula*) *fluvialis*, sp. n., Angas, P. Z. S. 1871, p. 20, pl. 1. fig. 31, R. Hawkesbury, brackish water, N. S. Wales.

VENERIDÆ.

Cytherea (*Callista*) *semperi*, sp. n., Dunker, l. c. p. 172, Pt. Mackay.

Cytherea (*Caryatis*) *indecora* (Phil.), Lischke, J. M.-Conch. ii. p. 109 Nagasaki.

Circe dispar (Chemn.) = *muscaria*, *pulicaria*, and *mixta* (Lam.), *id. ibid.*, Nagasaki.

Meroe excavata (Hanl.) = *menstrualis* (Menke) = *magnifica* (Reeve), *id. ibid.* p. 110, Japan.

RÖMER ("Monographie der Mollusken Gattung *Venus*," vol. ii. pts. 30-35,

pp. 65-112, pls. 22-35, Cassel, 4to) thus continues his monograph of *Tapes*, accurately describing and figuring the following spp. :—

Sect. ii. PAREMBOLA : *pulchella* (Lam.) = *castrensis* (Desh.), *bicolorata* (Reeve), *tenuistriata* (Sow.), *obsoleta* (Chemn.) = *corrugata* (Gmel.), *dactyloides* and *disrupta* (Sow.) : pp. 65-71, pls. 23 & 24.

Sect. iii. AMYGDALA (Röm.) : *decussata* (L.), only from the European seas ; *denticulata* (Sow.), *indica* (Hanl.), *punicea* and *violascens* (Desh.), *variiegata* (Sow.), *semidecussata* (Desh.), *philippinarum* (Ad. & Reeve), *ducalis* (Röm.), *intermedia* (Q. & G.), *anatina* (Sow.), *senegalensis* (Gmel.) = *pullastra* and *perforans* (Mont.), *florida* (Lam.) and varr. *bicolor*, *petalina*, and *catenifera* (Lam.), and of which *acuminata* (Sow.) is stated to be the young state, *geographica* (Chemn.), *glandina* (Lam.), *fabagella* (Desh.), *nitens* (Scacchi), *cumingi* (Sow.), *galactites* (Lam.), *bruguieri* (Hanl.), *cinerea* (Desh.), *analis* (Phil.) : pp. 71-97, pls. 25-33.

Sect. iv. HEMITAPES (Röm.) : *virginea* (L.) = *flammiculata*, *callipyga*, and *rimularis* (Lam.), *hiantina* and *tristis* (Lam.), *striata* (Chemn.) = *japonica* (Gmel.) = *elegantina* and *vermiculata* (Lam.) = *labuana* (Ad. & Reeve), &c., *cor* (Sow.), *marmorata* (Lam.), *recens* (Chemn.) = *marmorata* and *orientalis* (Reeve), *variabilis* (Phil.), *laterisulca* (Lam.), *dohrni* and *apaturia* (Röm.), *flammea* (Gmel.) = *radiata* (Chemn.) and *exserta* (Röm.) : pp. 97-112, pls. 33-35.

[*Tapes*] *Venus decussata* (L.) = *truncata* (Lam.) from the Indian seas, and is not the common European sp., which must therefore take the name of *reticulata* (Dacosta) : Récluz, Act. Soc. L. Bord. xxvii. p. 58. [It is seldom profitable to change long-accepted names; moreover, Linnæus may have included both these spp. under his *decussata*.]

Paratapes. Stoliczka, l. c. p. 144, proposes this generic name for Römer's section *Textrix* (type, *Venus textrix*, Chemn.), preoccupied among the *Annelides*.

Glossocardia, g. n. Two cardinal teeth and a somewhat remote posterior lateral tooth; upper cardinal tooth of the right valve bent downwards; antero-inferior tooth of the left valve sickle-shaped. Type *G. (Cypricardia) obesa* (Reeve). *Id.* l. c. p. 189.

Cypricardia coralliophaga (Chemn.), Lischke, J. M.-Conch. ii. p. 140, Nagasaki; *C. lirata* (Reeve), Bay of Yeddo, *id. ibid.* p. 173.

PETRICOLIDÆ.

Petricola mirabilis (Desh.), *id. ibid.* p. 122, Nagasaki.

Petricolaria. Stoliczka, l. c. p. 139, proposes this generic name for *Petricola pholadiformis* (Lam.).

CYRENIDÆ.

Cyrena (Corbicula) fluminalis (Müll.), Samarcand : Martens, Mal. Bl. xviii. p. 66, pl. 1. figs. 12-14.

Cyclas rivicola (Leach) found near Heilbronn, Wirtemberg : Krauss, JH. Ver. Württ. 1871, p. 11.

Sphærium consobrinum (*Cyclas*, Fér.) redescribed from Swedish specimens : Westerlund, Expos. crit. p. 154.

Pisidium pusillum (Gmel., Jenyns); *miliun* (Held, 1836) = *gassiesianum* (Dupuy, 1849) = *pulchellum*, var. δ (Jenyns) = *arcæforme* (Malm); *supinum* (Ad. Schmidt, 1850) = *conicum* (Baudon), and varr., all from Germany, are

comparatively described by Clessin, Mal. Bl. xviii. pp. 184-199. *P. gassiesianum* is recorded from S. Germany: *id.* Nachr. malak. Ges. iii. p. 20.

P. sp. n., from Lake Superior and Lake Michigan, not named but described by Verrill, Am. J. Sc. (3) ii. p. 449; Am. Nat. iv. p. 404.

CARDIIDÆ.

Cardium echinatum (L.). On some varr. of it, see Mörch, Vid. Medd. 1871, pp. 215 & 216, who (*ibid.*) admits the following varieties of *C. edule* (L.), occurring on the coasts of Denmark:—*crassum*, *balticum* (Beck, Reeve) = *glaucum* (Brug.)?, *rufovariegatum*, *inflatum* = *rusticum* (Eichwald) = *eichwaldi* (Reeve).

GLOSSIDÆ.

This name is proposed for the family hitherto called *Cyprinidæ* or *Iso-cardiidæ*, the generic name *Glossus* (Poli) being older than *Isocardia* (Lam.): Stoliczka, l. c. p. 183.

CHAMIDÆ.

Chama imbricata (Brod.), *ambigua*, *dunkeri*, *semipurpurata*, and *retroversa* (Lischke), all from Nagasaki: Lischke, J. M.-Conch. ii. pp. 126-131, pl. 9. fig. 4, pl. 8. figs. 2, 3, 4, 1, and pl. 9. figs. 1-3.

MYTILACEA.

LUCINIDÆ.

RÉCLUZ (Act. Soc. L. Bord. xxvii. pp. 35-41, and written so long ago as 1853), referring to a paper by Deshayes in J. de Conch. 1851, proposes to break up *Lucina*; *Codakia* (L. *tigerina*, L.) and *Loripes* being provided with internal short chondrophores or nymphs, the latter with a long cylindrical foot, the former with a short one, &c. He accordingly proposes a new genus, under the name *Jagonia*, distinct from the rest of *Lucina* by its external elongated nymphs, the edge of its mantle being crenulated by short tentacles, with the siphons in no way distinct from the rest of the mantle, its securiform foot, the strong and plicated lips of its mouth, and the gills of both sides being united in front and at the hinder end of the body.

Jagonia jagon (Adanson) = *Lucina pecten* (Lam.), *J. reticulata* (Poli) = *L. pecten* (Philippi), and *J. squamosa* (Brug.) = *L. imbricatula* (Adams) = *L. pecten* (Reeve) have been examined in spirit by the author; but the following spp. are referred to the above new genus only from a consideration of the shell:—*muricata* (Chemn.) = *scabra* (Lam.), *cribraria* (Conrad), *pectinella* and *pectinula* (Adams), *bella* and *nuttalli* (Conrad): *id.* l. c.

Lucina (*Loripes*) *lactea* (L.) = *fragilis* (Phil.), *L. lactea* (Lam.) = *lactea* (Montagu) = *gervillii* (Récluz), and *L. desmaresti* (Payr.) = *Amphidesma lucinalis* (Lam.): *id. ibid.* p. 34, footnote.

Lucina divergens (Phil., 1850) = *fibula* (Reeve, 1850), widely distributed in the Indian and Pacific seas, Martens & Langkavel, Don. Bism. p. 63; = *ramulosa* (Gould), also from Nagasaki, Lischke, J. M.-Conch. ii. p. 132. *L. pisi-dium* (Dunker, 1860) = *parvula* (Gould, 1861), Nagasaki, *id. ibid.*

Diplodontia orbella (Gould), Japan, very near *semiaspera* (Phil.) = *semireticulata* (Orb., 1847) = *granulosa* (Dunker, 1853), W. Indies: *id. ibid.* pp. 133-136.

UNGULINIDÆ.

Cyrenoida is referred to this family by Stoliczka, *l. c.* p. 260.

KELLIIDÆ.

Erycina (Lam., 1804) = *Kellia* (Turt.). This genus, with *Tellimya* (Brown) and *Lepton* (Turt.), are united with the *Laseidæ* of H. & A. Adams to constitute a family under the name *Erycinidæ*: *id. ibid.* p. 263 [preoccupied for a family of diurnal *Lepidoptera*].

Kellia subsinuata, sp. n., Lischke, Mal. Bl. xviii. p. 43, and J. M.-Conch. p. 136, pl. 10. figs. 1-3, Nagasaki.

Lasea rubra (Mont.) occurs in Japan: *id. ibid.* pp. 137-139.

GALEOMMIDÆ.

Scintilla armoricæ, sp. n., Crouan, in Taslé's Faune Mal. Mar. Suppl., and J. de Conch. xix. p. 271, Brest.

ASTARTIDÆ.

Astarte. Searles Wood supposes that the edge of the valves is smooth in young and denticulated in adult individuals. Ann. N. II. (4) vii. p. 171.

Astarte arctica (Gray, 1824, Forb. & Hanl.) = *Venus borealis* (Chemn. partim, nec L.) = *corrugata* (Brown, 1827, Lovén): Martens, Arch. Ver. Mecklenb. xxiv. pp. 71 & 72; found in the Baltic, near Warnemünde: Wiedemann, *ibid.* p. 71.

Cardita leana (Dunker), Lischke, J. M.-Conch. ii. p. 140, Nagasaki.

Cardita (*Actinobolus*) *godeffroyi*, sp. n., Dunker, Mal. Bl. xviii. p. 172 (locality not indicated, probably Polynesia).

Crassatella fulvida, sp. n., Angas, P. Z. S. 1871, p. 20, pl. 1. fig. 32, Pt. Jackson.

UNIONIDÆ.

Observations on species of *Unio* which have changed colour and assumed an unusual thickness in some parts, through changes (continued for about ten years) in the water wherein they lived, are given by VON HÜBER ("Zur Naturgeschichte der Unionen"), JB. Mus. Kärnth. x. pp. 151-157, pl. 3. For several other interesting observations concerning the breeding, growth, and habits of these bivalves, and the variability of some species, cf. Kobelt's Fauna nass. Moll. pp. 228-244, and Broeck, Ann. Mal. Belg. v. pp. 57-61 (*U. crassus* and *batavus*).

Unio crassus, var. *maximus*, Kobelt, Cat. eur. Binnenconch. p. 67, Sleswig.

Unio danelli, sp. n., Villa, J. de Conch. xix. p. 328, Brunswick, S. Australia.

Monocondylæa walpolii, sp. n., Hanley, P. Z. S. 1871, p. 587, and fig., Sarawak.

Anodonta. Clessin has observed *A. cygnea*, on being placed in a newly made pond, change itself into the form *piscinalis*, generally considered a distinct species. Ber. Ver. Augsb. xxi. p. 114.

MYTILIDÆ.

Mytilus edulis: its locomotion by climbing described by Lockwood, Am. Nat. iv. p. 331. For some notes concerning its varr. *incurvatus* (Penn.) and *ungulatus* (L.), cf. Fischer, Act. Soc. L. Bord. xxvii. p. 95.

Mytilus grayanus (Dunker, 1853) = *dunkeri* (Reeve, 1857): Lischke, J. M. Conch. ii. p. 145.

Mytilus atratus, sp. n., *id.* Mal. Bl. xviii. p. 44, and J. M.-Conch. ii. p. 146, pl. 10. figs. 4 & 5, Nagasaki.

Modiola plicatula (Say): its walking described by Lockwood, Am. Nat. iv. p. 331.

Modiola auriculata (Krauss), from E. Africa, also received from Kingsmill I.: Martens & Langkavel, Don. Bism. p. 63.

Modiola semivestita, sp. n., Dunker, Mal. Bl. xviii. p. 173, St. Vincent, Australia.

[*Modiola*] *Perna confusa*, sp. n., Angas, P. Z. S. 1871, p. 21, pl. 1. fig. 33, Pt. Jackson.

Crenella (*Modiolaria*) *adolphi*, Dunker, l. c., St. Vincent, Australia; *C. (M.) multistriata*, Smith, P. Z. S. 1871, p. 729, pl. 75. fig. 4, Wydah: spp. nn.

Modiolaria divaricata (Phil.), Lischke, J. M.-Conch. ii. p. 148, Nagasaki.

Lithodomus aristatus (Solander) = *caudiger* (Lam.) = *carpenteri* (Mörch), widely distributed, and *nasutus* (Phil.), from Nagasaki: *id. ibid.* ii. pp. 149-152.

AVICULIDÆ.

Avicula radiata (Pease), Martens & Langkavel, l. c. p. 63, pl. 4. fig. 5, Kingsmill I.

Avicula margaritifera, the pearl-oyster of the Red Sea: cf. Klunzinger, Z. Ges. Erdk. vi. pp. 70 & 71.

Electrina, new subgenus of *Avicula*. Shell more inequivalve, hinge-line short, posterior wing very short and indistinct. Type, *A. smaragdina* (Reeve). Stoliczka, Pal. Ind. iii. p. 391.

Pinna trigonalis (Pease), Martens & Langkavel, l. c. p. 64, pl. 4. fig. 7, Kingsmill I.

Perna vulsella (Lam.) = *chemnitziana* (Orb.) = *flexuosa* (Sow., Mörch), Japan, E. & W. Indies, and N.W. America: Lischke, J. M.-Conch. ii. pp. 153-155.

OSTREACEA.

ARCIDÆ.

Arca kraussi (Phil.) and *domingensis* (Lam.) = *squamosa* (Lam.) = *gradata* (Brod) = *divaricata* (Sow.), Nagasaki: Lischke, l. c. pp. 141-144.

Arca umbonata (L.) var., *martini* (Récl.), Brazil, *crossii* (Dunker), Matatlan, and *fuscomarginata* (*id.*), Madagascar, figured by Dunker, Nov. Conch. pp. 131-136, pl. 44. figs. 5-7, and pl. 45. figs. 1-4, 8-11, & 12-14.

Barbatia barbata (L.), var., *A. adolphi* and *petersi* (Dunker), figured, *id. ibid.* pp. 132-135, pl. 44. figs. 8-12, and pl. 45. figs. 5-7.

Pectunculus savignyi, Fischer, J. de Conch. xix. p. 219, Suez (fig. in Descr. de l'Egypte, Moll. pl. 10. fig. 4); *P. tumidus* and *perobliquus*, Dunker, Mal. Bl. xviii. pp. 173 & 174, Polynesia: spp. nn.

Limopsis brazieri, sp. n., Angas, P. Z. S. 1871, p. 21, pl. 1. fig. 34, Pt. Jackson.

NUCULIDÆ.

Nucula crassicostata, sp. n., Smith, *ibid.* p. 729, pl. 75. fig. 5, Wydah.

Leda tuberculata, *id. ibid.* p. 728, pl. 75. fig. 1, Wydah; *L. arcuata*, Sowerby, in Reeve's 'Conchologia Iconica,' part 289, fig. 20, locality unknown; *planulata*, *id. ibid.* fig. 22, Patagonia; *bicostata*, *id. ibid.* fig. 37, Panama: spp. nn.

PECTINIDÆ.

Pecten yessoensis (Jay), from Hakodade, *laqueatus* (Sow.) and *quadriliratus* (Lischke), Nagasaki: Lischke, J. M.-Conch. ii. pp. 157 & 158, pls. 13, 12, & 9, figs. 5 & 6. *P. latus*: Red-Sea individuals attributed to this belong to another sp.; *irregularis* (Sow.)=*limatula* (Reeve): *id. ibid.* pp. 157 & 158. *P. squamatus* (Gmel.), from Japan, *id. ibid.* p. 173.

Pecten rubellus, sp. n., Dunker, Mal. Bl. xviii. p. 173, Rockhampton.

Lima squamosa (Lam.), Nagasaki: Lischke, *l. c.* pp. 155 & 156.

SPONDYLIDÆ.

Plicatula echinata, sp. n., Dunker, *l. c.* p. 174, China Sea.

OSTREIDÆ.

Ostrea. Sowerby's continuation of the monograph of this genus in Reeve's 'Conchologia Iconica,' pt. 288, pls. 17-27. figs. 36-68, contains the following so-called new species:—*O. retusa*, fig. 42, *lima*, fig. 45, *sandwicensis* [*sic*], fig. 66, Sandwich I.; *quercinus* [*sic*], fig. 43, *lactea*, fig. 48, *attenuata*, fig. 49, *reniformis*, fig. 57, *lentiginosa*, fig. 58, *multiradiata*, fig. 59, *auriculata*, fig. 60, and *multicostata*, fig. 61, Japan; *lugubris*, N. America, fig. 63; *crenulifera*, Red Sea, fig. 67. The following are here figured for the first time:—*O. chemnitzii* (Hanley), China, fig. 47; *tubercularis* (Lam.), Timor, fig. 50; *lacerans* (Hanley), Senegal, fig. 51; *palmipes* (Sow.), Philippines, fig. 56 [= *paulucciæ* (Crosse, 1869), *sec. Crosse*], and *algoensis* (Sow.), Algoa Bay, fig. 65.

Ostrea edulis. Some notes on oyster-banks and breeding on the Danish coasts are to be found in Tids. Naturvid. (4) iii. 1871, by Collin; in Tids. Fisk. by Samme; and in Vid. Medd., 1871, p. 222, by Mörch.

On the season for Sleswig oysters to contain eggs, *cf.* Möbius, Nachr. malak. Ges. iii. pp. 131-134. The same author (Zool. Gart. xii. pp. 339-342), under the title "Ueber die neuere Austernzucht im Allgemeinen, und ihre Anwendbarkeit an unseren Küsten," gives an extract of his larger paper on oyster-breeding noticed in Zool. Rec. vii. pp. 113 & 179.

Some particulars and statistics concerning successful oyster-breeding at Arcachon and the islands of Ré and Noirmontiers, on the west coast of France, are to be found in Fischer's suppl. to the Conchol. fauna of the Gironde, Act. Soc. L. Bord. xxvii. pp. 75-80.

Syrski (in Wien. landw. Z.) describes the not very encouraging results of his endeavour to breed oysters at Grado, in the Adriatic Gulf (reprinted in Zool. Gart. xii. pp. 211-214).

Ostrea (*Gryphæa*, Lam.) *angulata* seems to do well when introduced from the Tagus into the oyster-beds of Arcachon: Fischer, Act. Soc. L. Bord. xxvii. p. 81.

Ostrea gigas (Thunb.) var. and *cucullata* (Born), Japan: Lischke, J. M.-Conch. ii. pp. 160 & 161; the first figured in pl. 14.

ANOMIIDÆ.

Placuna (Brug., 1792) = *Placenta* (Retz., 1788, H. & A. Adams, nec Klein, 1734); and *Placuna* (H. & A. Adams) is renamed *Placunema*, with type *P. sella* (Gmel.); together forming a new family, *Placunidæ*. Stoliczka, Pal. Ind. iii. pp. 450 & 451.

MOLLUSCOIDA

BY

EDUARD VON MARTENS, M.D., C.M.Z.S.

CONTRIBUTIONS TO FAUNAS.

34 species of *Tunicata* and 5 of *Polyzoa*, observed at St. Malo and Roscoff, N. France, are enumerated by Grube, JB. schles. Ges. xviii. pp. 63 & 64.

Fischer mentions *Argiope decollata*, *cistellula*, and *capsula*, *Megerlia truncata* and *Terebratulina caput-serpentis* as found on the western coasts of France: J. de Conch. xviii. pp. 377 & 378.

The same author (Act. Soc. L. Bord. xxvii. pp. 1-70, also published separately) has observed 50 species of *Bryozoa* on the S.W. coasts of France; he remarks that these agree somewhat more with the British than with the Mediterranean fauna, and is disposed to doubt Busk's identifications of *Bryozoa* from very different parts of the world, and of recent species with species of the cretaceous period.

24 species of simple and compound Ascidians, observed on the shores of New England, are described and figured (woodcuts), by Verrill, Am. J. Sc. (3) i. pp. 54, 93, 211, 288, & 443.

The *Brachiopoda* of the Caribbean Sea are enumerated, and those obtained during the United States Survey Expedition, in charge of Pourtales, fully described by Dall, Bull. Mus. C. Z. iii. no. 1, pp. 1-42, pls. 2.

15 Japanese recent spp. of *Brachiopodu* are discussed by Davidson, P. Z. S. 1871, pp. 300-311, pls. 30-31.

BRACHIPODA.

TEREBRATULIDÆ.

MORSE has published *in extenso* his observations concerning the early stages and development of *Terebratulina septentrionalis* (Couth.) [cf. Zool. Rec. vi. p. 593], stating that the apparatus supporting the arms is at first similar to the circular lophophore of the one, and afterwards to the bilateral lophophore of the other order of *Polyzoa*; he compares the brachial fold with the calice in the higher *Polyzoa*, the fold bordering the mouth with their epistome, the divaricator muscles of *Terebratulina* with the retractors of the *Polyzoa*, &c., and maintains his view that the *Brachiopoda* are true *Articulata*, having near affinities to the *Vermes* and *Polyzoa*. Mem. Bost. Soc. ii. part i. no. 11, and Ann. N. H. (4) viii. pp. 414-427, pls. 15 & 16. Dall's objections to Morse's theory answered: *id.* Am. J. Sc. (3) i. pp. 136-138; *Ann. Nat.* iv. p. 510.

The soft parts of *Terebratula cubensis*, *Waldheimia floridana*, and *Cistella lutea* are accurately described by DALL, Bull. Mus. C. Z. iii. pp. 5-7, 15-17, 22-24, pl. 2, and the young state of the first, pp. 8 & 9, pl. 1. figs. 8 & 9.

DAVIDSON, reviewing the recent Japanese *Brachiopoda*, adds numerous particulars concerning the classification and diagnosis of the *Brachiopoda* in general. P. Z. S. 1871, pp. 300-311.

Seguenza, treating of the tertiary *Brachiopoda* of S. Italy, corrects the synonymy of some recent spp. Bull. Malac. iv. pp. 9-16, 33-72.

Terebratula vitrea (Born): this recent species and some allied fossil species are discussed, and its principal varr. figured: *id. ibid.* pp. 33-37, pl. 6. figs. 1-11.

Terebratula cubensis (Pourt.)=*vitrea*, var. (Davidson), Dall. l. c. pp. 3-9, pl. 2. figs. 8-16, Florida.

Terebratula minor (Phil.)=*affinis* (Calcara)=*davidsoni* (A. Adams, 1867), Davidson, l. c. pl. 30. figs. 10-12, Japan.

Terebratulina caput-serpentis (L.), including *japonica* and *cumingi* (A. Adams), *id. ibid.* figs. 7-9, Japan.

Terebratulina cailleti (Crosse), Dall, l. c. pp. 10-12, Florida.

Waldheimia raphaelis (Dall), *picta* (Chemn.), and *grayi* (Davids.), Davidson, l. c. pl. 31. figs. 7-10, Japan.

Waldheimia floridana (Pourt.)=*septata* (Jeffr. nec Phil.): Dall, l. c. pp. 12-17, pl. 1. fig. 3, and pl. 2. figs. 1-3.

Terebratella coreanica (Ad. & Rv.), Davidson, l. c. p. 300, pl. 31. figs. 4 & 5; *marizæ* (A. Ad.), figs. 15-17, and *spitzbergensis* (Dav.), figs. 13 & 14, *id. ibid.* pl. 30; Japan.

Laqueus rubella (Sow.), *id. ibid.* figs. 18-22, Japan.

Magasella adamsti, *id. ibid.* p. 307, figs. 23 & 24, and *gouldi* (Dall, MS.), *id. ibid.* pl. 31. fig. 11, Japan: spp. nn.

Megerlia sanguinea (Chemn.), *id. ibid.* figs. 1 & 2, and var. *reevii* (Ismenia, A. Ad.), *id. ibid.* fig. 3, Japan.

Cistella rubroincta (P. *schrammi* var.), Dall, l. c. pp. 19 & 20, pl. 1. fig. 4, west of Tortugas, 30-43 fathoms, and *lutea* (P. *barrettiana* var.), *id. ibid.* pp. 20 & 24, fig. 5, pl. 2. figs. 4-8, Tortugas, 30-43 fathoms: spp. nn.

Platidia anomioïdes (Scacchi), hitherto only known from the Mediterranean, has been found in 237 fathoms on the Florida coast, and in 345 fathoms in the Shetland channel, *id. ibid.* p. 18.

Agulhasia, g. n. Arcigerous; beak pointed; deltidium closed by a plate fixed to the inner surface of the area, foramen at the cardinal termination of the deltidium; loop short, slightly reflexed and attached to the hinge by two crura; shell-substance penetrated by branching tubuli, as in *Terebratulina caput-serpentis*. The only Ancylobrach genus which has the beak pointed and its point not foraminate, like *Rhynchonella* and *Spirifer*. *A. davidsoni*, sp. n., Agulhas Bank, 45-50 fathoms. KING, Ann. N. H. (4) vii. pp. 109-112, pl. 11. figs. 1-8.

RHYNCHONELLIDÆ.

Rhynchonella psittacea (Gmel.), var. *woodwardi* (A. Adams), and *lucida* (Gould): Davidson, l. c. p. 309, pl. 31. figs. 13 & 14.

DISCINIDÆ.

MORSE recapitulates his observations on the early stages of *Discina*: *Ann. Nat.* iv. p. 493.

DALL (*Bull. Mus. C. Z.* iii. pp. 36-42) gives a systematic revision of this family, which contains several (mostly fossil) genera and subgenera. The recent species are enumerated as follows:—*Discina* (subgenus *Discina*) *striata* (Schumacher) = *radiosa* (Gould) = *evansi* (Davids.) = *ostreoides* (Lam.) = *Orbicula norvegica* (Sow.), Africa; *stella* (Gould), Indian Ocean: *Discina* (subgenus *Discinisca*) *lamellosa* (Brod.), Peru; *tenuis* (Sow., nec Reeve), locality unknown; *lævis* (Sow.), Chili; *cumingi* (Brod.), California, Panama; *antillarum* (Orb.), Cuba, Martinique; *atlantica* (Jeffer. MS.), NE. Atlantic.

Discina stella (Gould), Japan, described and figured by Davidson, *l. c.* p. 311, pl. 30. fig. 5.

CRANIIDÆ.

DALL (*l. c.* pp. 25-36, pl. 1. fig. 7) publishes a systematic revision of this family, characterizing a new (fossil) genus, *Craniscus*, and a new subgenus, *Cranopsis*. The recent species are enumerated as follows:—*C. suessi* (Reeve), Sydney; *C. rostrata* (Höninghaus), Mediterranean; *C. (?? Cranopsis) japonica* (A. Ad.), Japan; and *C. anomala* (Müll.), with many synonyms, *turbinata* (Poli), from the European seas, being regarded as a var., and a new (?) variety, *pourtalesi*, from Florida.

Crania japonica (A. Adams) described and figured by Davidson, *l. c.* p. 311, pl. 30. fig. 6.

LINGULIDÆ.

Lingula tumidula (Reeve), *smaragdina* (A. Ad.), *dumortieri* (Nyst, 1843) = *aspidea* (A. Ad., 1863), and *lepidula* (A. Ad.), Davidson, *ibid.* pp. 310 & 311, pl. 30. figs. 1-4, Japan.

Lingula parva, sp. n., Smith, *P. Z. S.* 1871, p. 730, Wydah.

TUNICATA.

KOWALEWSKY brings forward new observations on the early stages of the simple Ascidians in favour of his theory of their affinity to the *Vertebrata*. *Arch. mikr. Anat.* vii. p. 101, pls. 10-13.

DÖNITZ's paper on the so-called *chorda* of the Ascidian larvæ (*Zool. Rec.* vii. p. 184) is analyzed and discussed by an anonymous writer (under the initials N. N.) in *Q. J. Micr. Sci.* (2) xi. pp. 281-283.

Molgula pannosa, *retortiformis*, *littoralis*, *papillosa*, and *pilularis*, Verrill, *Am. J. Sc.* (3) i. pp. 54-58, New England: spp. nn.

Cynthia stellifera and *pulchella*, *id.* *l. c.* pp. 93, 98, New England: spp. nn.

Botryllus stellatus (Gould, nec Pall.), from New England, is renamed *gouldi*: *id.* *l. c.* p. 212.

Amauroucium glabrum, *pellucidum*, and *stellatum*, *id.* *l. c.* pp. 288-292, New England: spp. nn.

Macroclinum, g. n., = *Aplidium*, sect. 2, Savigny. *M. crater*, sp. n., from banks of Newfoundland: *id.* *l. c.* pp. 292-294.

Lissoclinum, g. n. Allied to *Didemnum*, the zooids being scattered along the common cloacal ducts. *L. aureum* and *tenerum*, spp. nn., New-England: *id. l. c.* pp. 444 & 445.

Leptoclinum albidum and *luteolum*, *id. l. c.* p. 446, New-England: spp. nn.

Doliolum. Several spp. have been observed in the Mediterranean by Moss, Q. J. Micr. Sci. (2) xi. pp. 403-405, pl. 18.

Appendicularia. Individuals containing eggs and spermatozoa are described by Saville Kent, *ibid.* pp. 267-270, pl. 14. figs. 1-4. On its anatomy, cf. Moss, Tr. L. S. xxvii. pp. 299-304, pl. xlvii.

POLYZOA.

CLAPARÈDE has discussed some controversial points of the anatomy and physiology of the *Bryozoa* in his "Beiträge zur Anatomie und Entwicklungsgeschichte der See-Bryozoen," Z. wiss. Zool. xxi. pp. 137-174, pls. 8-10 (1870). From observations made on *Bugula avicularia*, *Scrupocellaria scruposa*, and *Vesicularia cuscuta*, he regards the zoœcia as being the real animals, some of them having an intestine, and receives with doubt the physiological functions ascribed by Smitt to the floating cells and to the network of channels described by that eminent observer; he describes the simple structure of the endocyst in the marine *Bryozoa*; observes the reabsorption of the tentacles and intestines and the simultaneous appearance of the so-called "brown bodies;" describes the ramified nervous system and some hollow strings connected with it in *Bugula*, and the formation of the eggs within the zoœcium and their slipping into the ovicells; and, finally, states the difference between the budding of *Loxosoma* and that of *Pedicellina*.

NITSCHKE ("Beiträge zur Kenntniss der Bryozoen, Neue Folge: IV. Ueber die Morphologie der Bryozoen," Z. wiss. Zool. xxi.) publishes his views on the morphology of the *Bryozoa*. After a short recapitulation of the ideas of previous authors, he states his adherence to the view of Allman, also proposed, in somewhat obscure terms, by Reichert (cf. Zool. Rec. vii. p. 186), viz. that the cells (zoœcia) and polypids are to be regarded as two distinct individuals, the latter being produced by budding from the former, and that the individuals of the *Bryozoa* may be divided into *cystids* and *polypids*, in the same manner as the *Cœlenterata* are classified as *medusoid* or *hydroid*. The chief representatives of the cystid individuals are the zoœcia; but the avicularia and vibracula, the oœcia of the *Chilostomata* and *Crisiidae*, the joints of the stem in the *Vesiculariadae*, and the rooting-threads of some *Bryozoa* are also to be regarded as such. To the polypids, on the contrary, belong also the "peculiar bodies" described by Busk in the avicularia of some *Cellulariadae*, which bear feeling-bristles, and are named "Fühlknöpfe" (feeling-buttons) by the author. The genital function, commonly proper to the cystids, is transferred to the polypids in 1871. [VOL. VIII.]

Pedicellina. *Loxosoma* represents single polypid individuals, living and propagating by themselves. No *Bryozoa* are known which have only cystid individuals and wholly want polypids; but in the greater number cystids produce as well cystids as polypids, and the propagation of the *Bryozoa* cannot, therefore, be regarded on the whole as effected by a true alternating generation, which seems probable only in the *Vesiculariidae*, in which some cystids form the stem and others (the zoœcia) produce the eggs. The budding, in all *Bryozoa* which have been accurately observed, issues from the endocyst, not from the floating greasy or lymphatic corpuscles. Finally, the author is opposed to the application to the whole class of *Bryozoa* of the histological views taken by Reichert from the observation of only one species in its adult state.

NITSCHKE (*ibid.* "III. Ueber die Anatomie und Entwicklungsgeschichte von *Flustra membranacea*," l. c. pp. 1-53, pls. 1-3; also published, with the preceding paper, separately, Leipzig: 8vo, 83 pp., 3 pls.) gives a full account of the structure and anatomy of *Flustra membranacea* (L.), and of its whole life-history, tracing the budding of one cell (zoœcium) from the other, and the final decaying of the polypids; he points out that the two spines placed on the septum of the zoœcia belong to the hinder extremity of the younger individual, and maintains that the brown bodies found in the zoœcia are the remains of the decaying polypids, not secretions of the endocyst—also that the zoœcia, after losing their polypids, can continue living and produce new buds of polypids.

The same author (Q. J. Micr. Sci. 2, xi. pp. 155-162) describes the increase in colonies of this species, and comes to the conclusion that in it a "common bud" (in Smitt's meaning) does not exist; that the "brown bodies" are mere remains of decaying polypids (already stated by Smitt, but called in doubt by Claparède), and that a zoœcium, having lost its polypid, can produce a new one by an internal budding of its endocyst.

HINCKS (*ibid.* pp. 235-238), in opposition to Nitsche's statement that the "brown bodies" are mere remains of decaying polypids, is of Smitt's former opinion, that they are destined for the reproduction of polypids. This author has also published (Pop. Sci. Rev., Jan. 1870) a paper "On some interesting points in the History of Polyzoa," which the Recorder has not seen.

Electra, Lamx. Fischer separates the well-known *Flustra pilosa* (L.) from the genus *Membranipora* under the above name, *Electra verticillata* (Lamx.) being only a peculiar variety of growth of the same; six different varieties are enumerated. Act. Soc. L. Bord. xxvii. p. 15.

Valkeria [*Walkeria vel Valceriu*] *vidovici* (Heller) = *Vesicularia cuscuta* (L.), Claparède, Z. wiss. Zool. xxi. p. 143, footnote.

CRUSTACEA

BY

EDUARD VON MARTENS, M.D., C.M.Z.S.

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- DOHRN, A. Untersuchungen über Bau u. Entwicklung der Arthropoden. XI. Zweiter Beitrag zur Kenntniss der Malakostraken und ihrer Larvenformen. Z. wiss. Zool. xxi. pp. 356-379, pls. 27-30.
- HELLER, C. Untersuchungen über die Crustaceen Tirols. Verh. Ver. Innsbr. i. pp. 67-96, pls. 1 & 2.
- HESSE, M. Observations sur des Crustacées rares ou nouveaux des côtes de la France.—No. XIX. Ann. Sci. Nat. (5) .xv. 50 pp. 2 pls.
- POURTALES, L. F. DE. [See STIMPSON.]
- SIEBOLD, C. T. VON. Beiträge zur Parthenogenesis der Arthropoden. Leipzig, 1871, 8vo, 238 pp., with 2 pls.
- STIMPSON, W., & POURTALES, L. F. DE. Preliminary Report on the Crustacea dredged in the Gulf-stream in the Straits of Florida.—Part I. Brachyura. Bull. Mus. C. Z. ii. no. 2, Dec. 1870, pp. 109-160.

PHYSIOLOGY.

The regular occurrence of parthenogenesis in *Apus*, *Artemia*, *Limnadia*, and perhaps also *Polyphemus*, is substantiated by VON SIEBOLD (Beiträge &c. pp. 160-222). The ♂ of *Apus*, long unknown, has been detected by Kozubowski at Cracow, and subsequently found also in a few other localities, but always from 46 to 50 per cent. less in number than the ♀, according to the statements of different authors. Siebold himself has examined a large number of *Apus cancriformis*, from a pond near Munich, for 6 consecutive years, in some years during 2 or 3 different months, and on three occasions probably scrutinizing all the colony (once, no less than 5796 in number) existing in the pond, which was dried up: but *all* the specimens he examined were ♀. He is therefore persuaded that in *Apus*, as in some *Insecta*, the ♀ can produce fertile eggs without male connexion, at all

events for 6 consecutive generations. The exceeding rarity of the ♂ in *Artemia*, the want of our knowledge of that sex in *Limnadia*, and the occurrence only in autumn of males of *Polyphemus* and *Bythotrephes*, lead the author to the conclusion that in these genera a similar parthenogenesis is a regular (not exceptional) occurrence, varying in the two last-named genera at fixed periods with bisexual propagation, whereas in *Branchipus*, *Estheria*, and *Limnetis* the males are to be found in sufficient number. Finally, the author supports Lubbock's opinion (Phil. Tr. 1857), that no distinct line of division can be drawn between eggs and buds.

The spermatoids of *Gammarus pulex* described by BÜTSCHLI, Z. wiss. Zool. xxi. pp. 415 & 533, pl. 40. fig. 7.

TERATOLOGY.

HERKLOTS describes some deformities in the claws of several *Crustacea*, especially *Xantho punctulata* (Haan) and *Eriphia spinifrons* (Herbst), in which the movable finger is double or triple. Arch. Néerl. v. pp. 1-10, pl. 1: cf. also Tijdschr. Ent. (2) v. pp. 69-78, pl. i. for a similar paper by this author on these species and *Lithodes arctica* (Lam.).

CONTRIBUTIONS TO FAUNAS.

Böck's exhaustive paper on boreal and arctic *Amphipoda* (Overs. Dan. Selsk. 1870, pp. 83-278), mentioned in Zool. Rec. vii. p. 188, contains very valuable information on the geographical distribution of the northern species, chiefly in Spitzbergen, Greenland, and through the whole length of Norway.

Observations on the abundance of several arctic species are given by Buchholz, Erlebnisse der Mannschaft des Schiffes Hansa (Königsberg: 1871), pp. 3, 4, 13, &c.

The Norwegian *Mysidæ* are the subject of a monograph commenced by Sars (see p. 185).

A review of the *Cypridinidæ* of the European seas is given by Brady, P. Z. S. 1871, pp. 289-295.

The parasitic Copepods of Scandinavia are enumerated by Olsson, Act. Lund. v.

62 species of *Crustacea*, observed at St. Malo and Roscoff, in Northern France, are enumerated by Grube, Mittheil. üb. St. Malo u. Roscoff, pp. 64-66.

15 species of *Crustacea*, including 6 Cirripeds, observed by Lafont near Arcachon, are enumerated, Act. Soc. L. Bord. xxviii. pp. 260-262.

Some rare *Crustacea* found in Wirtemberg are indicated by Leydig, JH. Ver. Würt. xxvii. pp. 268-270; among them are *Daphnella brachyura* (Lievin), *Leptodora hyalina* (Liljeborg), and *Latona setifera*, in the lake of Constance, *Asellus cavaticus*, sp. n., in the cave of Falkenstein, and *Argulus phoxini*, sp. n., near Tübingen.

Klunzinger's life-like description of a coral-reef in the Red Sea treats, among other things, of the occurrence and habits of several *Crustacea*. Verh. z.-b. Wien, xx. pp. 389-394.

A few observations concerning Chinese freshwater crabs, kept alive for 40 or 50 days and used extensively as food, are to be found in Cooper's 'Pioneer of Commerce,' p. 424, extracted in Ann. N. H. (4) viii. p. 72.

For HAGEN's monograph of the North-American *Astacidae* see p. 185.

VERRILL has observed, in the depths of Lake Superior, *Mysis relicta* and *Pontoporia affinis*, both identical with individuals found in Lake Wetteren, in Sweden, by Lovén, and describes some other Isopods found in the same lake: Am. J. Sc. (3) ii. pp. 374 & 452. STIMPSON has found also a species of *Mysis*, probably *M. relicta*, in Lake Michigan: Am. Nat. iv. p. 404.

Some Crustacea found in caves of N. America are mentioned by Cope, Ann. N. H. (4) viii. p. 368.

The N.-American *Phyllopoda* are the subject of a paper by Packard, *ibid.* p. 332, and the *Ostracoda* by G. S. Brady, Canad. Nat. v. no. 4.

DECAPODA.

BRACHYURA

OXYRHYNCHA.

LEPTOPODIIDÆ.

Podochela gracilipes, sp. n., Stimpson, Bull. Mus. C. Z. ii. p. 126, reefs of Florida Straits.

Podonema [as *Podinema*, preoccupied in *Reptilia*], g. n., differs from *Podochela* in its hood-shaped rostrum and the existence of lamelliform ridges in the region of the pterygostoma, defining the afferent channels. *P. (Podochela) risii* (Stimps.) and *P. lamelligera* and *hypoglypha*, spp. nn., Straits of Florida: *id. l. c.* pp. 126 & 127.

EURYPODIIDÆ.

STIMPSON, *l. c.*, characterizes the following new genera and spp. &c.:—

Collodes trispinosus and *nudus*, Florida, pp. 120 & 121.

Arachnopsis, differing from *Collodes* in its filiform ambulatory feet and long eye-peduncles. *A. filipes*, reefs near Florida, 34–45 fathoms, p. 121.

Batrachonotus, characterized by the want of a terminal spine on the basal joint of the antennæ, and in its very long anterior and short posterior ambulatory feet. *B. fragosus*, Straits of Florida, p. 122.

Euprognatha, characterized by an interantennular spine, which renders the rostrum trifid, an erect spine on the orbital arch, and the meros joint of the outer maxillipeds being somewhat L-shaped. *E. rostellifera*, Florida Straits, pp. 122 & 123.

Amathia modesta, Sand Key, 120 fathoms, p. 124.

Anomalopus [as *Anomalipus*, preocc. in *Coleoptera*]. Carapace elongated, subcylindrical; posterior pair of feet larger than penultimate; orbital arch but slightly distinct; postocular spine small. Type of new subfamily, *Anomalopinæ* [better *Anomalopodinæ*]. *A. furcillatus*, Straits of Florida, 123 fathoms, pp. 124 & 125.

MAIIDÆ.

STIMPSON, l. c., characterizes the following new genera and spp. &c. :—

Mithrax pleuracanthus, *acuticornis*, and *holderi*, pp. 116 & 117, Florida and Tortugas.

Mithraculus ruber, Florida and Cuba, p. 118.

Tyche emarginata (White) = *Platyrhynchus trituberculatus* (Desbonne & Schramm), redescribed, p. 119.

Pyromaia [? *Piromaia*, vox hybrida, rectius *Apiomaia*]. Near *Microrhynchus* (Bell); carapace more elongated and pear-shaped; rostrum larger, prominent, simple; meros joint of the outer maxillipeds with an angular prominent external lobe. *P. cuspidata*, S.W. of Sand Key, Florida, pp. 109 & 110.

Pericera camptocera, *eutheca*, and *septemspinosa*, Florida, pp. 112 & 113. The author states that the eyes are perfectly retractile in this genus.

Tiarinia setirostris, Key West, p. 114.

Seyra umbonata, Sand Key, Florida, p. 115.

Pisa antilocapra and *prælonga*, Florida reefs, pp. 110 & 111.

ACANTHONYCHIDÆ.

Mocosoa, g. n., near *Epialtus*, but with immovable eyes, as in *Huenia*. *M. crebripunctata*, sp. n., French Reef, Straits of Florida: *id. l. c.* p. 128.

PARTHENOPIDÆ.

Lambrus crenulatus (Sauss.) and *pourtalesi*, *fraterculus*, *agonus*, spp. nn., all from the Straits of Florida: *id. l. c.* pp. 129–132.

Solenolambrus, g. n. Carapace naked, polished; the afferent channels distinct; meros joint of outer maxillipeds without notch. *S. typicus* and *tenellus*, spp. nn., Straits of Florida, in about 90 and 40 fathoms: *id. l. c.* pp. 132–135.

Mesorheza, g. n. Carapace as in the former; afferent channels meeting at the middle of the endostome; meros joint of outer maxillipeds acutely produced forward at its internal angle, covering the palpus. *M. sexspinosa*, [rectius *sex-spinosa*], sp. n., Loggerhead Key, Straits of Florida, 11 fathoms; *id. l. c.* pp. 135–137.

Cryptopodia concava, sp. n., Straits of Florida: *id. l. c.* p. 137.

CYCLOMETOPA.

CANCRIDÆ.

Carpoporus, g. n. Chelipeds, when retracted, leaving a large hole between carpus and hand for the passage of water to the afferent branchial apertures. *C. papulosus*, sp. n., *id. l. c.* pp. 138 & 139, Straits of Florida.

Micropanope, g. n. 5 teeth on the antero-lateral margin, as in *Panopeus*, but the 2nd tooth coalescent with the scarcely prominent angle of the orbit, and the posterior tooth minute; external hiatus of the orbit reduced to a simple emargination. Of small size, never littoral. *M. sculptipes*, sp. n., Straits of Florida, 15–68 fathoms: *id. l. c.* pp. 139 & 140.

Chlorodius dispar, sp. n., *id. l. c.* p. 140, Cuba.

ERIPHIIDÆ.

Pilumnus floridanus, *lacteus*, *agassizi*, *nudifrons*, and *granulimanus*, spp. nn., *id. l. c.* pp. 141-143, Straits of Florida.

Melybia, g. n. Allied to *Melia*; antero-lateral margin 3-toothed; basal joint of outer antennæ firmly soldered; feet spinulose. *M. thalamita*, sp. n., Florida Straits, 15-37 fathoms: *id. l. c.* pp. 144 & 145.

PORTUNIDÆ.

Liocarcinus, g. n., proposed for *Portunus marmoreus* (Leach) on account of the aberrant form of its maxillipeds and its naked carapace, which almost entirely conceals the first abdominal joint: *id. l. c.* pp. 145 & 146, footnote.

Bathynectes, g. n. Antero-lateral teeth spiniform, separated by considerable intervals; no frontal median tooth; hiatus of orbit widely open; meros joint of outer maxillipeds not projecting anteriorly. *B. longispina* & *brevispina*, spp. nn., Straits of Florida, 100-120 fathoms: *id. l. c.* pp. 145 & 147.

Achelous spinicarpus and *tumidulus*, spp. nn., *id. l. c.* pp. 148 & 149, Florida reefs.

Portunus puber (L.) proved to be a dangerous enemy to oyster-beds by Lafont & Fischer, Act. Soc. L. Bord. xxvii. p. 77.

CATOMETOPA.

CARCINOPLACIDÆ.

Two new subfamilies, *Euryplacinae* and *Eucratopsinae*, are proposed by Stimpson (*l. c.* p. 152), in both of which the vergal canals are closed, though in the first the anterior corners of the posterior segment of the sternum is exposed, instead of being covered by the abdomen, and the first joint of the abdomen is narrow and very little developed. In the latter, this joint is well developed, and much broader than the second, which is much narrower than the third. To it belong *Eucratopsis* (Smith) = *Eucrate* (Dana), and *Panoplax*, g. n., resembling *Panopeus*, with deflexed front, broad and depressed carapace, elongated hands, &c., containing a sp. n., *P. depressa*, East and Middle Keys, Tortugas, Florida.

PINNOTERIDÆ.

Pinnoteres ascidiicola, on *Ascidia canina*, and *P. pectunculi*, in the shell of *Pectunculus*: Hesse, Ann. Sci. Nat. (5) xv. p. 30-38, spp. nn., Northern France.

OXYSTOMA.

CALAPPIDÆ.

Acanthocarpus, g. n. Carapace without lateral expansion; fronto-orbital region very broad, occupying more than half the width of the carapace; a strong tooth about the middle of the postero-lateral margin; chelipeds with

a large horizontal spine on the carpus; all ambulatory feet with slender dactyli. *A. alexandri*, sp. n., Quicksands, Florida, 74 fathoms: *id. l. c.* pp. 152 & 153.

MATUTIDÆ.

Osachila, g. n. Allied to *Hepatus* in all essential characters, but differing notably in the shape of the carapace, which is nearly as long as broad, with the front much produced, and has a very uneven surface, exhibiting 6 chief protuberances. *O. tuberosa*, sp. n., Florida reefs, 36-68 fathoms: *id. l. c.* pp. 154 & 155.

LEUCOSIDÆ.

Iliacantha, g. n. Closely allied to *Ilia*, but having 3 spines (one median) at the posterior extremity of the carapace, and the hands twisted, so that the fingers open in a vertical plane. *I. subglobosa* and *sparsa*, spp. nn., Florida reefs, 30-60 fathoms: *id. l. c.* pp. 155 & 156.

Myropsis, g. n. Nearly allied to *Myra*, but more globular, with 3 posterior spines and no median or hepatic ridges; outer margin of the maxillipeds straight; basal joint of the antennulæ crested. *M. quinquispinosa*, sp. n., Florida reefs, 21 and 82 fathoms: *id. l. c.* pp. 156 & 157.

Callidactylus, g. n. Outer margin of the exognath of the outer maxillipeds convex; basal joint of the antennulæ with no indurated crest; ambulatory feet naked, penultimate joint compressed, with a laminiform crest above and below; dactyli of the 3 anterior pairs 3-edged, of the posterior 2-edged. *C. asper*, sp. n., Florida reefs, 16-37 fathoms: *id. l. c.* pp. 157-159.

Lithadia cadaverosa, sp. n., *id. l. c.* p. 159, Florida reefs, 35-40 fathoms.

ANOMURA.

LYTTKENS (Act. Lund. v. pp. 43-111, 2 pls.) has given a very copious and detailed description of the skeleton and the muscles of *Lithodes maia*, often quoting those of the lobster for comparison. It is, however, to be regretted that he has not finally summed up the principal resemblances and dissimilarities which this genus has on the one side with the *Brachyura* and on the other with the *Macrura*.

The long-known connexion of some spp. of *Pagurus* with others of *Actinia*, *Hydractinia*, and Sponges (*Suberites domuncula*), attached to dead shells, is discussed at great length, and some new facts of similar fossil occurrences in tertiary and cretaceous strata are added, by Des Moulins, Act. Soc. L. Bord. xxviii. pp. 325-356.

Porcellana? Zoea-like larva described by A. Dohrn, Z. wiss. Zool. xxi. p. 372, pl. 29. figs. 48-51.

MACRURA.

CHANTRAN has continued his observations concerning the development of the Crayfish and its moults. C. R. lxxiii. p. 220; abstracted in Ann. N. II. (4) vii. pp. 219 & 220 (cf. Zool. Rec. vii. p. 194).

HAGEN has published a very elaborate monograph of the American *Astacidae* (written in 1868, and issued as an illustrated catalogue of the Mus. Comp. Zool. at Harvard College, no. iii. 1870, pp. 1-109, pls. 1-11, imp. 8vo). He points out accidental variations and differences of age and sex, and states that in most species of *Cambarus* there are two forms of the males, one retaining in advanced age the articulation and shape of the first abdominal legs proper to the young specimens, while the other loses this articulation. He urges the generic difference between the American *Cambarus* and the Old-World *Astacus*, and states that all freshwater crayfish of N. America east of the Rocky Mountains belong to the former, and all living in California, Oregon, and British Columbia to the latter of those genera.

The following species of American *Astacidae* are observed and described by him :—

Cambarus. Group 1: *acutus* (Girard), *clarkii* (Gir.), pl. 4, *troglodytes* (Lec.), *blandingi* (Harlan), *fallax*, sp. n., Florida, *lecontei*, sp. n., Georgia, Alabama, Florida, *spiculifer* and *angustatus* (Lec.), *versutus*, sp. n., Alabama, *penicillatus* (Lec.), *pellucidus* (Tellk.), pl. 6.

Group 2: *C. lancifer*, sp. n., Mississippi, *affinis* (Say), pl. 5, *virilis*, sp. n., pl. 8, from Canada to Texas, *placidus*, sp. n., Tennessee, Illinois, Texas, *juvenilis*, sp. n., Kentucky and Osage R., *propinquus* (Girard), *obscurus*, sp. n., New York, *rusticus* (Girard), *immunis*, sp. n., hand, pl. 8. fig. b, Illinois and Alabama, *extraneus*, sp. n., Tennessee R.

Group 3: *C. bartoni* (Fabr.), *robustus* (Gir.), *obesus*, sp. n., pl. 9, from Lake Michigan to New Orleans, *latimanus* (Lec.), *advena* (Lec.), pl. 7, and *carolinus* (Erichs.).

Astacus gambeli (Gir.), pl. 11, *nigrescens*, *townsendii*, pl. 10, and *klamathensis* (Stimps.).

The first abdominal legs of the males, the antennal lamina, epistoma, and external spine of the antennæ of many of these species are figured, pls. 1-3.

Astacus subgründialis, *chenoderma*, and *breviforceps*, spp. nn., Cope, P. Am. Phil. Soc. xi. pp. 605-607, fossil, from the freshwater territory of Idaho, may be mentioned here as most nearly allied to recent American spp.

Paneus? Zoëa-like larva described by A. Dohrn, Z. wiss. Zool. xxi. p. 375, pls. 29 & 30. figs. 54-61.

STOMAPODA.

SARS ('Carcinologiske hidrag til Norges Fauna,' i. Hefte, Christiania, 1870, 4to, pp. 64, pls. 5) has commenced a monograph of the Norwegian *Mysidæ*, containing a concise account of the many peculiarities of that family, and accurate descriptions of 3 genera and 8 species.

He distinguishes the genera of the *Mysidæ* as follows :—

1. All pleopods of ♂ different from those of ♀, natatory, 2 branched.

Molar process of mandibles distinct.

Incisive lobes of 1st pair of maxillæ 3.

Marsupium of ♀ formed by the basis of only the posterior 4-6 feet.

- Eyes well developed, red; feet filiform, telson entire, short.
Erythrops.
- Eyes well developed, black; feet short, with long bristles, telson
 with stout spines *Leptomysis.*
- Eyes rudimentary, separate; feet stout, with terminal claw.
Amblyops.
- Eyes rudimentary, coalite; feet filiform, without terminal claw.
Pseudomma.
- Marsupium formed by the basis of all the feet, and also of 2nd pair of
 maxillipeds; otoliths rudimentary *Boreomysis.*
- Incisive lobes of 1st pair of maxillæ 2; feet stout, hairy, joints 3 & 4
 dilated, terminal joint setiform *Mysideis.*
- Molar lobes of mandibles rudimentary.
- Appendage of upper antennæ in ♂ large; tarsi 3-jointed.
Mysidopsis.
- Appendage of upper antennæ in ♂ rudimentary; feet very stout, tarsi
 2-jointed; pleopods of ♂ with a peculiar coiled appendage.
Siriella.
2. Only some pleopods of ♂ different from those of ♀.
- Only 1st pair of pleopods equal in both sexes; the next in ♂ natatory,
 2-branched *Parerythrops.*
- The first 2 pairs of pleopods equal in both sexes; the next two not na-
 tatory in ♂, penultimate pair very long.
- The last pair of pleopods natatory, 2-branched; dorsal shield overlap-
 ping almost all segments of anterior part of body *Heminysis.*
- The last pair of pleopods rudimentary as in ♀; dorsal shield small.
Mysis.
3. All pleopods equal in both sexes *Mysidella.*

Erythrops, new name for the preoccupied *Nematopus* (Sars), comprising
goesi = *Mysis erythropthalma* (Goës), *id. l. c.* p. 24, pl. 1; *serrata*, p. 27, pl. 2.
 figs. 1-12; *micropthalma* = *Nematopus microps* (Sars, 1863), p. 30, pl. 2.
 figs. 13-19; *pygmæa* = *N. elegans* (*id.*, 1862), p. 33, pl. 2. figs. 20-28; and
abyssorum, p. 36, pl. 5. figs. 1-12: all formerly named by Sars, but now fully
 described and figured: coasts of Norway, the last in the Christiania-fjord, at
 150-230 fathoms.

Parerythrops, g. n. *P. obesa* (*Nematopus*, Sars, 1865), Dröbak, near Chris-
 tiania, 50-60 fathoms: *id. l. c.* pp. 40-47, pl. 3.

Pseudomma. Eyes without pigment, crystalline lens, or other optic ele-
 ments, forming a semilunar lamina at the base of the antennæ. *P. roseum*
 and *affine* (Sars, 1869), Lofoden Islands and Hardanger-fjord, at about 200
 fathoms, in company with spp. of *Erythrops*: *id. l. c.* pp. 48-60, pl. 4, and
 pl. 5. figs. 13-22.

Mysis mæbii, sp. n., locality unknown, the appendages of the pleopods in
 the male minutely described by A. Dohrn, Z. wiss. Zool. xxi. pp. 359-363,
 pls. 27 & 28. figs. 11-22.

Euphausia: development described by Metschnikoff, *ibid.* pp. 397-401, pl. 34;
 it is hatched from the egg as a Nauplioid larva, and the 3 pairs of feet behind
 the larval natatory feet make their appearance at the same moulting, contrary
 to the rule prevailing in the Branchiopods, Copepods, and Cirrheids.

Leucifer. Some particulars concerning the circulatory and generative organs observed in specimens from the Philippines, probably of *L. reynaudi* (M.-E.), are described and figured by SEMPER ("Zoologische Aphorismen," i.), Z. wiss. Zool. xxii. pp. 305-307, pl. 22.

Leucifer reynaudi (M.-Edw.): male and female generative organs and other sexual differences described by A. Dohrn, l. c. pp. 356-359, pl. 27. figs. 1-10.

Cerataspis monstruosus [rectius *-a*] (Gray) = *Cryptopus defrancii* (Latr.), from the Indian seas, accurately described, *id. ibid.* pp. 366-372, pls. 28 & 29. figs. 35-47.

AMPHIPODA.

Böck (Overs. Dan. Selsk. 1870, pp. 83-278) gives the following systematic arrangement of the Norwegian and Greenland species:—

I. Div. HYPERIDÆ [rectius -IIDÆ, *Hyperidæ* being also preoccupied in *Coleoptera*] (Dana).

1st fam. Hyper[i]dæ: *Hyperia*, *Metæcus*, *Parathemisto*, *Themisto*.

2nd fam. Tryphanidæ (new): *Tryphana*.

II. Div. GAMMARIDÆ (Dana).

1st fam. Prostomatæ (Böck, 1860): *Trischizostoma*.

2nd fam. Orchesti[i]dæ: *Orchestia*, *Talitrus*, *Hyale*.

3rd fam. Gammaridæ (Dana).

Subfam. 1. Lysianassinæ (Dana): *Lysianassa*, *Ambasia*, *Ichnopus*, *Socarnes*, *Callisoma*, *Hippomedon*, *Cyphocaris*, *Eurytenes*, *Aristias*, *Anonyx*, *Onisimus*, *Menigrates*, *Orchomena*, *Tryphosa*, *Normania*, *Opis*, *Acidostoma*.

Subfam. 2. Pontoporiinæ (Dana): *Pontoporia*, *Priscilla*, *Argissa*.

Subfam. 3. Stegocephalinæ (Dana): *Stegocephalus*, *Andania*.

Subfam. 4. Amphilochinæ: *Amphilochus*, *Gitana*, *Astyra*.

Subfam. 5. Phoxinæ: *Phoxus*, *Harpina*, *Sulcator*, *Urothoe*.

Subfam. 6. Stenothoinæ: *Stenothoe*, *Metopa*, *Cressa*.

Subfam. 7. Syrrhoinæ: *Syrrhoe*, *Tiron*, *Bruzelia*.

Subfam. 8. Pardaliscinæ: *Pardalisca*, *Halice*, *Nicippe*.

Subfam. 9. Leucothoinæ (Dana): *Lilljeborgia*, *Eusirus*, *Leucothoe*, *Tritopsis*.

Subfam. 10. Ædicerinæ (Lillj.): *Ædiceros*, *Acanthostephea*, *Monocondodes*, *Halimemon*, *Pontocrates*, *Aceros*, *Halicreion*, *Ædiceropsis*, *Paramphithoe*.

Subfam. 11. Iphimedi[i]næ: *Vertumnus*, *Iphimedia*, *Odius*, *Laphystius*.

Subfam. 12. Epimeri[i]næ: *Acanthozona*, *Epimeria*.

Subfam. 13. Dexamininæ: *Dexamine*, *Lampra*.

Subfam. 14. Atylinæ: *Atylus*, *Pontogeneia*, *Hakirages*, *Calliopius*, *Amphithopsis*, *Cleidippides*, *Laothoes*.

Subfam. 15. Gammarinæ (Dana): *Gammarus*, *Pallasia*, *Mæra*, *Melita*, *Elasmopus*, *Chirocrates*, *Gammaracanthus*, *Niphargus*, *Ama-thilla*, *Melphidippa*.

Subfam. 16. Ampelisinæ (Sp. Bate): *Ampelisca*, *Haploops*, *Byblis*.

Subfam. 16b. Leptochirinæ: *Leptochirus*, *Goesia*.

Subfam. 17. Photinæ : *Photis*, *Microprotopus*, *Xenoclea*.

Subfam. 18. Microdeutopinæ : *Microdeutopus*, *Aora*, *Autonoe*, *Proto-media*, *Gammaropsis*, *Podoceroopsis*.

Subfam. 19. Amphithoinæ : *Amphithoe*, *Synamphithoe*.

Subfam. 20. Podocerinæ : *Podocerus*, *Janassa*, *Cerapus*.

Subfam. 21. Chelurinæ (Allman) : *Chelura*.

Subfam. 22. Corophi[i]næ (Dana) : *Corophium*, *Siphonæcetus*, *Glaucanome*, *Hela*.

4th fam. Dulichi[i]dæ (Dana) : *Dulichia*, *Paradulichia*, *Lætmatophilus*, *Xenodice*.

5th fam. Caprellidæ.

Subfam. 1. Caprellinæ : *Proto*, *Cercops*, *Ægina*, *Æginella*, *Caprella*, *Podalirius*.

Subfam. 2. Cyaminæ (Krøyer) : *Platycyanus*, *Cyanus*.

Gammarus arcticus and *Themisto borealis* occur in large swarms in the Arctic sea, and form the principal food of many marine animals, probably also of the Right Whale. Buchholz, Erlebnisse &c. pp. 3-5.

GAMMARIDÆ.

Böck, l. c., characterizes the following new genera and spp. &c. :—

Lysianassa plumosa, Haugesund, in Norway, p. 96.

Ambasia. Hypostome very convex and prominent; maxillæ of first pair with very small inner lamina; maxillipeds with very large outer lamina; saltatory feet of the last pair short, with much shorter inner branch; caudal appendage short, cleft. *A. danielsseni*, Norway, pp. 97 & 98.

Ichnopus minutus, Christiania-fjord, p. 99.

Socarnes, for *Anonyx vahli* (Krøyer), = ? *Ephippiphora*, White, pp. 99 & 100.

Hippomedon. Mandibles short, left with small accessory tooth; palpus of maxillæ of first pair with many short teeth at tip; maxillipeds short and broad; caudal appendage long and deeply cleft. *Anonyx holbælli* (Krøyer) and *Lysianassa abyssi* (Goës), from Norway and Greenland, pp. 102 & 103.

Cyphocaris (Lütken, MS.). Mandibles very short, with a long and very broad palpus; palpus of the maxillæ of 1st pair with few strong teeth and a very long bristle at tip; 1st segment of the body very gibbous, nearly concealing the head; no 1st epimerum, the 3rd and 4th coalite. *C. anonyx* (Lütken, MS.), Greenland: pp. 103 & 104.

Aristias. Mandibles elongate, narrow, enlarged at the tip; maxillæ of 1st pair very broad. *Anonyx tumidus* (Krøyer) = *Lysianassa audouiniana* (Sp. Bate), Greenland, Norway, pp. 106 & 107.

Anonyx liljeborgi, Norway, p. 109.

Onisimus. Hypostome prominent, mandibles at the tip with a strong tooth and a narrow accessory tooth; maxillæ of 1st pair with 2 plumose bristles on tip of inner lamina. *Anonyx litoralis*, *plautus*, and *edwardsi* (Krøyer), Greenland and Norway pp. 111-113.

Menigrates. Mandibles very short, with short palpus; maxillæ of 1st pair with 2 plumose bristles; maxillipeds very large and short. *Anonyx obtusifrons* (Böck), Norway, pp. 113 & 114.

Orchomena, for *Anonyx pinguis* (Böck), *serratus* (Böck) = *edwardsi* (Sp. Bate), *minutus* (Krøyer), and *goesi*, sp. n., Norway, pp. 114-116.

Tryphosa [preoccupied in *Lepidoptera*], for *Anonyx nanus* (Kröyer), *longipes* (Sp. Bate), and *høringi*, sp. n., pp. 117-119.

Normania, for *Opis quadrimana* (Sp. Bate), pp. 119 & 120.

Priscilla, allied to *Pontoporia*, but the anterior epimera with long plumose bristles, and feet of 1st and 2nd pair almost equal. *P. armata*, Norway, p. 124.

Argissa, also allied to *Pontoporia*; upper antennæ much shorter than the lower; 1st epimerum very large; feet of 1st and 2nd pair equal, feeble. *A. typica*, Christiania-fjord, p. 125.

Bæckia, g. n. Epimera primi paris ab iis secundi paris occulta, hæc omnium maxima. Carpus pedum secundi paris valde elongatus, manus perbrevis, vix prehensilis. Pedes quinti, sexti, septimi paris longitudine sensim accrescentes; articulus primus paris septimi parum dilatatus. Pedes saltatorii perbreves, aculeis validis armati. Appendix caudalis perbrevis, postice leviter emarginata, non vere fissa. Lamina interior maxillæ primi paris elongata, perparum lata, extremitate setis nonnullis prædita. Pedes maxillares elongati; lamina exterior angusta, margine interiore dentibus elongatis instructo; articuli palpi graciles. *B. typica*, sp. n., Malm, *Œfv. Vet. Ak.* 1870, pp. 543-546, pl. 5. fig. 1, Bohuslän, S. Sweden.

Stegocephalus christianiensis, sp. n., Böck, *l. c.* p. 128.

Andania, g. n. Allied to *Stegocephalus*; mandibles without teeth at tip; palpus of maxillæ of 1st pair elongated, 2-jointed; caudal appendage entire, very small. *A. abyssi* and *nordlandica*, spp. nn., Norway: *id. l. c.* pp. 128 & 129.

Amphilochus odontonyx, *bispinosa* [*sic*], and *tenuimanus*, spp. nn., Norway: *id. l. c.* pp. 130 & 131.

Gitana, g. n. Allied to *Amphilochus*; 3rd joint of mandibular palpi shorter than 2nd; palpus of maxillæ of first pair single-jointed; hands narrow, scarcely subcheliform. *G. sarsi* and *rostrata*, spp. nn.; Norway: *id. l. c.* p. 132.

Astyra, g. n. Also allied to *Amphilochus*; maxillipeds with a very large many-toothed external lamina. *A. abyssi*, sp. n., Hardanger-fjord, Norway: *id. l. c.* p. 133.

Harpina, g. n. Allied to *Phoxus*; palpus of 1st pair of maxillæ 2-jointed. *H. (Phoxus) plumosus* (Kröyer) and *crenulata*, sp. n., Norway, *id. l. c.* pp. 135 & 136.

Urothoe marinus [*sic*] (Sp. Bate) is described by Grube, Mittheil. &c. p. 55, pl. 2. fig. 4, from the French N. coast.

Metopa, g. n. Allied to *Stenothoe* (Dana); mandibular palpus short, 3-jointed; palpus of 1st pair of maxillæ 1-jointed. *M. (Leucothoe) chypæata* and *glacialis* (Kröyer), *M. (Montagua) alderi* (Sp. Bate), and *bruzelii* (Goës), and *affinis*, *longicornis*, *megachir*, *longimana*, and *nasuta*, spp. nn., Norway fjords: Böck, *l. c.* pp. 140-145.

Cressa, g. n. Also allied to *Stenothoe*; mandibular palpus elongate, 3-jointed; upper antennæ much thicker and longer than lower. *C. schioedtei* and *minuta*, spp. nn., Norway: *id. l. c.* pp. 145 & 146.

Syrrhoë levis, sp. n., Norway, *id. l. c.* p. 148.

Bruzelia, g. n. Allied to *Tiron* (Lillj.) = *Tessarops* (Norman). Mandibles very thick, broad, pyramidal, notched at tip; body subdepressed, with prominent epimera; caudal appendage long, entire. *B. typica*, sp. n., fjords of Norway: *id. l. c.* pp. 149 & 150.

Pardalisca abyssi, Norway, *id. l. c.* p. 152; *bæcki*, Malm, *l. c.* p. 547, pl. 5. fig. 2, Koster I., S. Sweden (and Böck, *l. c.*, Norway): spp. nn.

Halice, g. n. Allied to *Pardalisca*; head small, not swollen; front beak

elongate; lower antennæ with very long peduncle. *H. abyssi* and *grandicornis*, spp. nn., fjords of Norway: Böck, *l. c.* pp. 152 & 153.

Tritropis, new name for *Amphitonotus* (Costa, 1851), type *Oniscus aculeatus* (Lepechin, 1778) = *Talitrus edwardsi* (Sabine); *T. helleri*, sp. n., Norway, *id. l. c.* pp. 158 & 159.

Ediceros borealis, sp. n., Greenland and Finmark, *id. l. c.* pp. 162 & 163.

Acanthostephia, g. n. Allied to *Ediceros*; body keeled, posterior abdominal and postabdominal segments prolonged into long spines. Type, *Amphithonotus malmgreni* (Goës): *id. l. c.* p. 163.

Monoculodes grubei, *longicornis*, *kræyeri*, *packardi*, *tenuirostratus*, *tuberculatus*, *borealis*, and *latimanus*, spp. nn., Norway: *id. l. c.* pp. 165-169.

Halmemon, g. n. Allied to *Monoculodes*, carpus of 1st and 2nd pair of feet elongate. *H. (Ediceros) brevicar* (Goës), and *mælleri*, *saussurii*, and *longimanus*, spp. nn., *id. l. c.* pp. 169 & 170.

Pontocrates, g. n., = *Kræyeria* (Sp. Bate, *partim*); feet of 1st pair very strong, those of 2nd with a very long cheliform hand. *Kræyeria norvegica* (Sp. Bate) and *haplocheles* (Grube, 1864) = *lavicarpa* (Sp. Bate, 1869): *id. l. c.* pp. 171 & 172.

Halicrion, g. n. Allied to *Ediceros*; maxillipeds with very small laminae and very long palpus. *H. longicaudatus*, sp. n., Norway, *id. l. c.* p. 173.

Paramphithoe parva, sp. n. Norway, *id. l. c.* p. 177.

Acanthozona, new name for *Acanthosoma* (Owen), type *Oniscus cuspidatus* (Lepechin, 1778) = *Acanthosoma hystrix* (Owen), *id. l. c.* p. 184.

Dexamine heibergi, sp. n., Norway, *id. l. c.* p. 187.

Lampra, g. n., allied to *Dexamine*, for *Atylus gibbosus* (Sp. Bate), *id. l. c.* p. 188.

Atylus nordlandicus, sp. n., Nordland, Norway, *id. l. c.* p. 193; *A. falcatus*, Metzger, xxi. JB. Ges. Hann. p. 28, German Sea, E. Friesland, 22 fath.: spp. nn.

Pontogenia, g. n., for *Atylus inermis* (Krøyer, Sp. Bate), Böck, *l. c.* p. 194.

Halirages, g. n., for *Atylus bispinosus* (Sp. Bate), *Amphithoe fulvocincta* (Sars), and *H. borealis*, sp. n., Norway, *id. l. c.* pp. 194-196.

Amphithopsis malmgreni and *longimana*, spp. nn., Norway, *id. l. c.* pp. 199 & 200.

Clidippides, g. n., for *Dexamine tricuspis* (Krøyer, Sp. Bate), *id. l. c.* p. 201.

Laothoes, g. n. 3rd joint of mandibular palpus very broad, equal to half length of 2nd. *L. meinerti*, sp. n., Norway, *id. l. c.* p. 202.

Gammarus lacustris, sp. n., Smith, Am. J. Sc. (3) ii. p. 453, Lake Superior.

Elasmopus latipes, sp. n., Christiania-fjord, *id. l. c.* p. 212.

Melphidippa, g. n., for *Gammarus spinosus* (Goës), and *M. longipes* and *borealis*, spp. nn., Norway, *id. l. c.* pp. 218 & 219.

Ampelisca assimilis, *dubia*, and *propinqua*, spp. nn., Norway, *id. l. c.* pp. 222, 224, 225.

Haploops setosa, sp. n., Bergen, Norway, *id. l. c.* p. 228.

Byblis, g. n., for *Ampelisca gaimardi* (Krøyer); 3rd joint of mandibular palpus much shorter than 2nd: *id. ibid.*

Goesia, g. n. Allied to *Leptochirus*; body subdepressed, flagellum of upper antennæ obsolete, 2nd pair of feet stronger but not much longer than 1st. *Autonoe depressa* (Goës), Spitsbergen, *id. l. c.* p. 231.

Photis luetkeni, sp. n., *id. l. c.* p. 233.

Xenoclea, g. n. Allied to *Microprotopus*; upper antennæ with 3rd joint of the peduncle elongate, without accessory flagellum; last pair of saltatory feet 2-branched. *X. batii*, sp. n., Norway, *id. l. c.* pp. 234 & 235.

Autonoe plumosa, sp. n., Christiania-fjord, *id. l. c.* p. 239.

Protomedea longimana, sp. n., Norway, *id. l. c.* p. 240.

DOMICOLÆ.

Synamphithoe longicornis, sp. n., Norway, *id. l. c.* p. 245.

Podocerus megacheir, sp. n., Norway, *id. l. c.* p. 247.

Janassa, new name for *Jassa* (Bruzel.), = *Podocerus variegatus* (Leach), *id. l. c.* p. 250.

Cerapus longimanus, sp. n., Norway, *id. l. c.* p. 252.

COROPHIIDÆ.

Siphonæceles colletti, Norway, *id. l. c.* p. 258; *S. cuspidatus*, Metzger, xxi. JB. Ges. Hann. p. 30, German Sea, E. Friesland, 16 fath. : spp. nn.

Glaucanome kroeyeri and *steenstrupi*, spp. nn., Norway, *id. l. c.* pp. 259 & 260.

DULICHIIDÆ.

Dulichia nordlandica, *tuberculata*, and *curticauda*, spp. nn., Norway, *id. l. c.* pp. 263 & 264.

Paradulichia, g. n. Antennæ much shorter, saltatory feet of the last pair with only one very small branch. *P. typica*, sp. n., Hardanger-fjord, Norway, *id. l. c.* p. 265.

Lætmatophilus spinosissimus, sp. n., Hardanger-fjord, *id. l. c.* p. 266.

Xenodice, g. n. Inner lamina of 2nd pair of maxillipeds with several bristles; upper and lower antennæ subequal, with short multiarticulate flagella. *X. frauenfeldti*, sp. n., Hardanger-fjord, *id. l. c.* pp. 266 & 267.

HYPERIIDÆ.

Hyperia medusarum (Müll.) = *latreillii* (M.-E.) = *oblivia* (Kröyer) = *Hicella orbignii* (Strauss) = *Lestrignionus exulans* (Kröyer) = *L. kinahani* (Sp. Bate), and *H. spinipes* (Boeck), both Norwegian, described: *id. l. c.* pp. 85 & 86.

Metæcus abyssorum, sp. n., *id. l. c.* p. 86, Norway.

Parathemisto, g. n. Allied to *Themisto*; feet of 3 last pairs nearly equal, 4th joint of 3rd and 4th pairs scarcely dilated. *P. (Themisto) compressa* (Goës) and *P. abyssorum*, sp. n., from the fjords of Norway, *id. l. c.* p. 87.

Themisto libellula (Mandt, 1822) = *arctica* (Kröyer) = *crassicornis* (*id.*), and *bispinosa*, sp. n., both Arctic, *id. l. c.* p. 88.

Tryphana, g. n. Distinguished from the other *Hyperiidæ* by the absence of mandibular palpi, the rudimentary maxillæ, and the 3-jointed upper antennæ. The author forms for it a separate family, *Tryphanidæ*. *T. malmii*, sp. n., Hardanger-fjord, Norway, *id. l. c.* pp. 88 & 89.

LÆMODIPODA.

CAPRELLIDÆ.

Caprella loveni, sp. n., *id. l. c.* p. 276, Norway.

CYAMIDÆ.

LÜTKEN (Dan. Selsk. Skr. 1870, pp. 279 & 280) gives a conspectus of the known boreal spp. of this family, characterizing the following new genus and spp. &c. :—

Platycyamus, g. n. 1st segment of body distinct from head; 1st pair of feet nearly equal to 2nd. *P. (Cyamus) thompsoni* (Gosse) from the "Dögling" (*Chenocetus rostratus*), p. 279.

Cyanus mysticeti from the Right Whale, *monodontis*, sp. n., from the Narwhal, *boopis (ceti)*, O. Fabr.) from *Megaptera boops, nodosus=ceti* (Zool. Dan.) from the Narwhal, and *globicipitis*, sp. n., from the Grindwhal (*Globiceps*), are specifically distinguished, p. 280.

ISOPODA.

ASELLIDÆ.

Asellus cavaticus, sp. n., found in the cave of Falkenstein, Wirtemberg, shortly indicated by Leydig, JH. Ver. Würt. xxvii. p. 269.

Asellus tenax, sp. n., Smith, Am. J. Sc. (3) ii. p. 453, Lake Superior.

CYMOTHOIDÆ.

HERKLOTS (Arch. Néerl. v.) characterizes the following 2 new genera (indistinctly) and species:—

Epichthys giganteus, pp. 3-8, figs. 1-9, 95 millims. long. Probably from the Indian Archipelago. Nearly allied to *Anilocra* (Leach).

Ichthyoxenus jellinghausi, pp. 9-17. Parasitic on a freshwater fish of the family Cyprinidæ, *Puntius maculatus* (Bleeker), in Java.

PHYLLOPODA.

APODIDÆ.

Apus cancriformis and *productus*. The sexual differences and relations of these spp. have been the subject of careful researches by VON SIEBOLD (*cf. supra*), who states that in the ♀ the transformation of the 11th pair of feet to egg-bearing organs, accompanied by abortive development of the gills, begins in individuals in which the dorsal shield measures only 5 millims., whereas in the ♂ the same pair of feet remains similar to the others, and that the sexes can consequently be distinguished with certainty from that age by the mere inspection of this pair of feet. The males are stated to be somewhat smaller than the females.

Apus lucasanus (♂ and ♀), Kansas, *newberryi*, Utah, *æqualis* (♂ and ♀), Matamoras, and *himalayanus* (more nearly allied, by the length of the shield, to the European *cancriciformis* than the other spp.), R. Sutlej, Himalayas, spp. nn. Packard, in "Preliminary Notice of new North-American Phyllopoda," Am. Journ. Sc. ii. 1871, pp. 109-111, and Ann. N. H. (4) viii. pp. 333-335.

BRANCHIPODIDÆ.

Streptocephalus texanus, sp. n., *id.* Am. Journ. Sc. ii. 1871, p. 112, and Ann. N. H. (4) viii. p. 335, Texas.

Artemia salina. VON SIEBOLD (*l. c.* pp. 197-210) maintains that this animal is by no means hermaphroditic, but the males are very distinguishable, though exceedingly rare, there being in some localities and seasons only females, which propagate by parthenogenesis. The organ which was supposed by

Joly (1840) to be a testicle, is, according to v. Siebold, a gland, which produces the shell of the egg. He thinks that *Artemia* may be kept distinct from *Branchipus* by the different and more rudimentary formation of its tail, and that under the name *A. salina* several different species, or at least races, have been confounded.

LIMNADIIDÆ.

Limnadia hermanni. The males are hitherto unknown, all described as belonging to that sex by Leydig, Koch, S. Fischer and Chyzer proving to belong to other genera, especially *Estheria*. The summit or umbo of the shell, distinctly perceptible in the latter, is not distinguishable in *Limnadia*. v. Siebold, *l. c.* pp. 210-214.

Limnadia texana, sp. n., Packard, Am. Journ. Sc. ii. 1871, p. 113, and Ann. N. H. (4) viii. p. 336, Texas.

Estheria belfragii, Texas, and *morsii*, Iowa, spp. nn., *id. l. c.* pp. 114, 116, & 336 & 337.

Limnetis gracilicornis, sp. n., Texas, *id. l. c.* pp. 116 & 337.

CLADOCERA.

Leptodora hyalina (Lilljeborg, 1860) = *Hyalosoma dux* (Wagner, 1868; Zool. Rec. vii. p. 199), = *Polyphemus kindti* (Focke, in the political newspaper "Weserzeitung," Bremen, 22 Sept. 1844); and both sexes of it are known: v. Siebold, *l. c.* pp. 220-222.

OSTRACODA.

CYPRIDIDÆ.

Potamocyppris, g. n., Brady, Tr. North. Durh. iii. pt. 2, pl. 12. [In a paper "On bivalve Entomostraca," not seen by the Recorder.]

Xiphochilus [preoccupied in *Pisces*], g. n., *id. l. c.* pl. 14.

Candona brachyura, Heller, Verh. Ver. Innsbr. i. p. 93, pl. 2, Tyrol.

CYPRIDINIDÆ.

The species living in the European seas are reviewed by Brady, P. Z. S. 1871, pp. 289, 295. They are 12, distributed in the genera *Cypridina* (M.-E.), *Bradycinetes* (Sars), *Philomedes* (Lillj.), and *Asterope* (Phil.) = *Cylindroleberis* (Brady). The following are described and figured:—

Bradycinetes brenda (Baird) = *globosa* (Lillj.) = *Ast. grænlantica* (Fischer), Greenland, Norway, Northumberland, Bay of Biscay, p. 292, pl. 26. fig. 6; *Philomedes interpuncta* (Baird) = *longicornis* (Lillj.), Britain and Norway, p. 293, pl. 26. figs. 1-5; *folini*, sp. n., Bay of Biscay, p. 294, pl. 27.

ENTOMOSTRACA.

CYCLOPIDÆ.

Cyclops clausi, p. 73, figs. 1 & 2, *grelleri*, p. 74, figs. 3 & 4, Tyrol, Heller, *l. c.* pl. 1: spp. nn.

SIPHONOSTOMA.

OLSSON has published two papers under the titles "Prodromus faunæ Copepodorum parasitantium Scandinaviæ" (Act. Lund. v. pp. 1-49, 2 pls.), and "Nova Genera parasitantia Copepodorum et Platyelminthium" (*l. c.* vi. pp. 5 & 6, 1 pl.), the contents of which will be noticed *infra*.

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ARGULIDÆ.

Argulus phexini, sp. n., Tübingen, S. Germany, indicated by Leydig, JH. Ver. Württ. xxvii. p. 269.

CALIGIDÆ.

Caligus curtus (Müll.) = *bicuspidatus* (Nordm.) = *elegans* (Bened.), on various species of fishes, chiefly *Gadidæ*; *C. belones* (Kröy.), ♂ described; *C. rapax* (M.-E. ?, Steenstr.) = *gurnardi* and *lumpi* (Kröy.), on *Trigla*, *Acanthias*, *Molva*, *Chinæra*, &c., described by Olsson, l. c. pp. 5-10; larva of the last figured, pl. 1. figs. 1 & 2.

Lepeophthirus hippoglossi (Kröy.), *pectoralis* (Müll.), *branchialis* (Malm), and *salmonis* (Kröy.), described, id. l. c. pp. 11-14.

Trebius caudatus (Kröy.), on *Raia batis*, id. l. c. p. 14; larva, figs. 3 & 4.

Nogagus socialis, sp. n., Skagerrack, on *Acanthias vulgaris*, id. l. c. p. 16, pl. 1. fig. 5.

Echthrogaleus perspicax, sp. n., on *Acanthias vulgaris*. ♂ little known, agreeing with *Nogagus*; ♀ described: id. l. c. pp. 18-20, pls. 1 & 2. figs. 6 & 7.

Pandarus bicolor (Leach), on the same shark, described, id. l. c. p. 21, pl. 2. fig. 8.

Cecrops latreilli (Leach) on the gills of *Mola nasus*, id. l. c. p. 22.

Hesse, Ann. Sci. Nat. (5) xv., describes the following new genera and species:—

Megalobrachinus suboculatus from gills of *Mugil capito*, p. 2, pl. 1. figs. 1-7.

Macrobrachinus punctatus from gills of *Chrysophrys aurata*, p. 6, pl. 1. figs. 8-15.

Hæma[to]philus roseus from gills of *Motella vulgaris*, p. 9, pl. 1. figs. 16, 17.

Metoponamphrissontes ornatus from gills of *Scombrox campe*, p. 12, pl. 2. figs. 1-6.

Metopocatacotinus hirsutus from gills of *Belone vulgaris*, p. 15, pl. 2. figs. 7-10.

Megasanoicus bimaculatus, probably from a compound *Ascidia*, *Polyclinum constellatum*, p. 17, pl. 2. figs. 11-17.

[The genera of the above, all new, are so verbosely described that no distinctive characters can be given for them: some of the names, moreover, transgress the well-known Linnæan canon, and are too long for practical use.]

Doropygus cristatus and *postremoglobosus* from *Ascidia canina*, pp. 21 & 23, pl. 2. fig. 18.

Botryllophilus propinquus from a compound *Ascidia*, p. 25.

Ceratrichodes flavus from a social *Ascidia*, p. 27.

Biocryptus calthæus from a compound *Ascidia*, p. 29.

DICHELESTIDÆ.

Eulaetylina acuta (Bened.), from the gills of *Acanthias vulgaris*, described, id. l. c. p. 24, pl. 2. fig. 9.

Clavella hippoglossi (Cuv.), ♀ redescribed, id. l. c. pp. 25 & 26.

Peniculus clavatus (Müll. nec Kröy.), from *Sebastes*, described; nearly allied to *Clavella*, but anterior antennæ wanting: id. l. c. pp. 27 & 28, pl. 2. figs. 10 & 11.

CHONDRACANTHIDÆ.

Chondracanthus cornutus (Müll.) in the branchial cavity of several spp. of *Pleuronectes*; *C. annulatus*, sp. n., from the gills of *Raja batis*; *C. gurnardi* (Kröy.), *merlucii* (Holt.), *lophii* (Johnst.), and *nodosus* (Müll.), the last from *Sebastes*. ♂ and ♀ of all these described, id. l. c. pp. 29-35: the new sp. g ured pl. 2. figs. 13-15.

Lamippe rubra (Bruzel.), S. Sweden, from the cavity of *Pennatula rubra*. Adult specimens described, *id. l. c. vi. p. 6, pl. 1. figs. 4 & 5.*

Enalcyonium, g. n. Corpus feminae elongatum, segmentis nullis vel (in adulto) minus distinctis. Antennae anteriores fere triarticulatae, articulo ultimo elongato, subulato. Rostrum nullum. Maxillipedum triarticulatum duo paria. Rudimenta pedum abdominalium in junioribus. Appendices caudales juniorum trifurcae, adularum indivisae, crassae. Allied to *Lamippe*. *E. rubicundum*, sp. n., Bohuslän, S. Sweden, from *Alcyonium digitatum*, on the slime of which it feeds, *id. l. c. vi. p. 6, pl. 1. figs. 1-3.*

LERNÆOPODIDÆ.

Lernæopoda edwardsi, new name for *L. salmonæa* (Mayor, M.-E., nec Kröy.), and *L. longimana*, subsp. n., allied to *L. gadi* (Kröy.), from gills of *Raja fullonica* and *batis*: *id. l. c. v. pp. 36 & 38, pl. 2. figs. 18-22.*

Vanbenedenia krøyeri (Malm), ♂ & ♀ described, *id. ibid. pp. 39 & 40, pl. 2. figs. 16 & 17.*

Charopinus dalmanni (Retz.), from the nostrils and gills of *Raja batis*: *id. ibid. p. 41.*

Brachiella rostrata (Kröy.), from *Hippoglossus*, ♂ and young ♀; and *B. obesa* (*Lernæopoda*, Kröy.), from the mouth of *Trigla gurnardus*: described, *id. ibid. pp. 41-44.*

Anchorella rugosa and *emarginata* (Kröy.), both from *Anarrhichas*, and scarcely distinct: *id. ibid. pp. 44 & 45.*

LERNÆIDÆ (*Pennellidæ*).

This family consists rather of analogous than of absolutely allied forms, the males and the shape of the ovisac being different. *Medesicastes*, *Lestira*, and even *Silenium* may be removed to the *Chondracanthidæ*; *Penella* and *Lernæa* to the *Dichelestidæ*: *id. ibid. pp. 45 & 46.*

Lernæanicus spratti (Sow.) = *monilaris* (M.-E.), and *L. encrasicoli* (Turt.), from the eye and pectoral fin of *Clupea sprattus*, very closely allied, described, *id. ibid. pp. 46 & 47.*

Lernæa branchialis (L.). A few remarks concerning a specimen found on *Labrus mixtus*: *id. ibid. p. 48.*

A Lernæan species, living on the blind fish, *Amblyopsis*, in the Wyandotte Cave, is indicated by Cope in the Indianapolis Journal, Sept. 5, 1871 [*cf. Ann. N. H. (4) viii. p. 369*].

XIPHOSURA.

A. S. PACKARD (P. Am. Ass., reprinted in Q. J. Micr. Sci. (2) xi. pp. 263-267, and also abstracted, with figures, in Am. Nat. iv. pp. 498-502) has published a paper "On the Embryology of *Limulus polyphemus*," in which the development of that sp. is elaborately discussed. The eggs are laid in great numbers loose in the sand, the ♂ fertilizing them after they are dropped. The primitive bud is confined to a minute area, and rests on the top of the yolk, as in the Spiders and *Crustacea* without metamorphosis. In the first stage, 3 pairs of rudimentary limbs are observed, the most anterior representing the false mandibles of Savigny, and being situated just in front of the mouth-opening. In a second stage, there are 6 pairs of appendages, increasing in

size from the head backwards, and the whole embryo covers but about a third of the visible portion of the yelk. Subsequently, the 5 pairs of legs increase in size, and are doubled on themselves, while the mandibles remain very small, and 2 pairs of gills make their appearance. At a little later period, about the middle of embryonic life, the embryo throws off an embryonic skin (*Nauplius*-skin). Still later, the claws are developed, the heart appears, the abdominal part of the dorsal portion grows broader, with the segments more distinct. Just before hatching, the cephalothorax spreads out, the 2 eyes and the pair of ocelli are distinct, the 6 segments of the cephalothorax can, with care, be distinguished, the 9 abdominal segments are most clearly defined, but only a rudimentary spine has appeared on the coxal joint, corresponding to the numerous teeth in after life, and the whole embryo bears a very near resemblance to certain genera of Trilobites, as *Trinucleus* and *Asaphus*. In about 6 weeks from the time the eggs are laid, the embryo hatches, the segments are obliterated, the abdominal spine is very rudimentary, forming the 9th segment. The young animal swims briskly up and down the receptacle in which it is placed, skimming about on its back by flapping the gills, not bending the body. At the succeeding moult, between 3 and 4 weeks after hatching, the abdominal spine becomes ensiform, and about thrice as long as broad. A second moult occurs about 4 weeks afterwards.

This author also discusses the morphology of *Limulus* (Proc. Bost. Soc. N. H. Oct. 1870, and Am. Nat. iv. pp. 754-756); he regards the anterior part of the shield as cephalothorax, and the posterior as abdomen—features which distinguish it from all recent adult *Crustacea*, but agreeing with the Zoea-stage of some of them and with the Trilobites.

LOCKWOOD has observed the habits (feeding, spawning, and moulting) of *Limulus polyphemus*, and compares it morphologically with *Eurypterus* and *Pterygotus* (Trilobites). Am. Nat. iv. pp. 257-273, pl. 3.

CIRRIPEDIA.

PELTOGASTRIDÆ.

Sacculina. Anderson (P. Z. S. 1871, p. 144) notes the occurrence in the Andaman Islands, Bay of Bengal, on *Thalamita crenata*, of a species apparently not distinct from that found in Europe.

ARANEIFORMIA.

PYCNOGONIDÆ.

Nymphon pumilio, sp. n., Grube, JB. schles. Ges. xviii. p. 85, St. Malo; the hinder pair of palpi without denticulated spines.

Phoxichilus laevis, sp. n., *id. ibid.* and Mittheil. &c. pp. 31 & 50, pl. 1. fig. 1, St. Malo.

ARACHNIDA

BY

The Rev. O. P. CAMBRIDGE, M.A., C.M.Z.S.

BLACKWALL, JOHN. Notice of Spiders captured by Miss Hunter in Montreal, Upper Canada; with descriptions of Species supposed to be new to Arachnologists. Ann. N. H. (4) Dec. 1871, pp. 429-436.

Records 9 species of various genera, 5 species being described as new.

CAMBRIDGE, O. P. Notes on some Arachnida collected by Cuthbert Collingwood, Esq., M.D., during rambles in the China Sea &c. P. Z. S. 1871, pp. 617-622, pl. xlix.

Records 12 species of *Araneidea* of various genera, 2 species being described as new; also two species of different genera of *Scorpionidea*, and one of *Phalangidea*.

CAPELLO, F. DE BRITO. Especies novas ou pouco conhecidas d'Arachnidios d'Africa occidental. Jorn. Sc. Lisb. i. pp. 79-88, pl. ii.

Describes 2 new species, of different genera, of *Araneidea*, and records several others.

EMERTON, J. H. Flying Spiders. Amer. Nat. v. pp. 148-155.

An interesting paper on the mode in which Spiders are transported from place to place by means of their own threads. Extracts are given from the works of Darwin, Blackwall, and Murray, showing the different theories proposed to account for the facts relating to this subject.

HASSELT, A. W. M. Araneæ exoticæ quas collegit pro Museo Lugdunensi medicus militaris primi ordinis Ludeking, E. W. A., ex India orientali (Java). Tijdschr. Ent. (2) 1871, pp. 172-178.

Records known species of the following families:—*Epeirides* 31, *Agelenides* 1, *Pholcides* 1, *Lycosides* 5, *Thomisides* 6, *Attides* 13, *Mygalides* 2, *Dysderides* 2; and ends with "N.B. Plures harum diagnosium, Attidum præcipue, adhuc magis minusve incertæ sunt habendæ."

KOCH, LUDWIG. Die Arachniden Australiens, nach der Natur beschrieben und abgebildet. Nürnberg : 1871-72.

An important and comprehensive work, intended to include the Arachnida of all that part of the globe known as Australasia. Five parts of 4to size have already appeared, containing pp. 1-248, and pls. i.-xx. In these five parts 157 species of *Araneidea*, chiefly of the families *Epeirides* and *Theridiides*, have been described, 101 being described as new, and 8 new genera are characterized. The figures given in the plates are numerous, and admirably executed in black and white.

MENGE, A. Preussische Spinnen. IV. Abtheilung. Schr. Ges. Danz. (N. F.) pp. 265-296, pls. 50-53. (Cf. Zool. Rec. vi. p. 142.)

The present part concludes the genus *Dictyna*, and comprises the genera *Tegenaria*, *Cicurina*, *Philæca*, *Cryphæca*, *Textric*, *Agelena*, *Cybaeus*, *Amaurobius*, *Ctenium*, and *Argyroneta*.

NICHOLSON, HENRY ALLEYNE. A Manual of Zoology for the use of Students, with a general introduction on the principles of Zoology. Edinburgh & London : 1870.

Chapter xxxvi. (pp. 221-230) contains a short general view of the class *Arachnida*, in which *Podosomata* (*Nymphon* and *Pycnogonum*), *Linguatulina*, and *Tardigrada* are included, forming the 1st and 2nd orders of the first great division ; in the latter order are included the *Acaridea*. Order 3 (*Adelarthrosomata*) includes Phalangids, Chelifers, and Solpugids. The two main divisions of *Arachnida* are based on the [supposed] differences in the breathing-organs, tracheal and pulmonary.

NINNI, A. P. Catalogo degli Araneidi Trevigiani. Venezia : 1869, (separate copy) pp. 1-10.

Includes 124 known species, distributed amongst 9 families.

——. Indice Alfabetico, Sinonimico e Sistematico degli Aracnidi Veneti dell' ordine Araneina. Parte prima. Venezia : 1870, (sep. copy) pp. 1-27.

Recites the literature on the subject, including and collating lists of species published by v. Martens in 1838, Contarini, 1843, v. Martens, 1845, Contarini, 1847, Disconzi, 1865, Canestrini, 1867 and 1868 (3 papers), Canestrini & Pavesi, 1869, and Ninni, 1869.

PACKARD, Junr., A. S. Guide to the Study of Insects. Salem : 1869.

The portion of this well-known work (pp. 626-669) referring to the *Arachnida* consists of a short general account of the whole class, treating of both internal and external organization, as well as classification. The spinnerets of the *Araneidea* are looked upon as modified legs (p. 631). The maxillary palpi are supposed to have the function of the antennæ (p. 629) in insects, and the legs of the first pair to be homologous with their labial palpi. The *Arachnida* are constituted an order below *Insecta*, and are divided into three suborders—*Araneina*, *Pedipalpi*, and *Acarina*. *Pedipalpi* include Solpugids and Phalangids, as Scorpions, &c. (*Pedipalpi*, Latr.). The *Araneina*

(true Spiders) are placed above the *Pedipalpi*; the *Tardigrada* are included under *Acarina*; and *Thelyphonus* is made a genus of the family *Phrynidae*. [Cf. Zool. Rec. v. p. 190, where parts 1 & 2 of this work are noticed.]

TACZANOWSKI, LADISLAS. Les Aranéides de la Guyane française. Hor. Ent. Ros. viii. pp. 32–132, Taf. iii. & iv.

A first instalment of a work on the Spiders of French Guiana, from a collection made by M. Constantin Jelski, and now in the Warsaw Museum. The present paper treats of the family *Attides*, of which 64 species are recorded; of these, 61 are described as new.

THORELL, TAMERLAN. Om Arachnider från Spetsbergen och Beeren-Eiland. Cefv. Vet. Ak. xxviii. pp. 683–702.

Records 6 species of *Araneidea* and 8 of *Acaridea*. Of the former 5, and of the latter all, are described as new.

———. Om några Arachnider från Grönland. L. c. xxix. pp. 147–166.

Records 14 species of *Araneidea* and 6 of *Acaridea*. Of the former 7, and of the latter 3, are described as new.

———. Remarks on Synonyms of European Spiders. No. 3. Upsala: 1872, pp. 229–374.

The present number of this valuable work comes down to the genus *Attus*, and fully bears out the justice of the remarks made upon it by the Recorder (Zool. Rec. vii. p. 211).

ZIMMERMANN, HERMANN. Die Spinnen der Umgegend von Niesky. Verzeichniss I. Ein Beitrag zur Kenntniss der Arachnidenfauna der Oberlausitz. Abh. Ges. Görl. xiv. pp. 69–136.

Records 151 known species of *Araneidea*, distributed among 8 families:—*Epeiridae* 26, *Theridiidae* 46, *Agelenidae* 6, *Drassidae* 15, *Dysderidae* 2, *Lycosidae* 19, *Thomisidae* 21, and *Attidae* 16. Although not pretending to add to the scientific knowledge of the *Araneidea*, this paper shows that the author is a painstaking and accurate observer.

In Scot. Nat. i. p. 191, is a list of some rare and local spp. of Scotch Spiders observed by the Recorder in a collection made by Mr. James Hardy.

KNEELAND, in an article on "Sexes of Spiders," in the 'Annual of Scientific Discovery; or year-book of facts in Science and Art,' 1869, p. 234 misquotes from a paper by the Recorder (Zool. s. s. iii. pp. 1240–1242), whom he makes to state, contrary to fact, that no example of the ♂ of the *Epeiridae* was known to him or to be found in the great museums of Europe. He also erroneously converts a conjecture of the Recorder's, as to the probable appearance of ♂ *Gasteracantha*, into a statement of fact.

A useful abstract of Bertkau's paper on the structure and use of the falces (Arch. f. Nat. 1870; cf. Zool. Rec. vii. p. 207) is contained in Z. ges. Naturw. 1870, pp. 200–202.

CLEMENTI (Am. Ent. i. p. 62) notes the occurrence of *Gordius* in a Spider; and Hagen (ib. p. 69) enumerates similar instances observed in Europe.

ARANEIDEA.

THERAPHOSIDES.

AUSSERER, in his "Beiträge zur Kenntniss der Arachniden-Familie der Territellariæ" (Verh. z.-b. Wien, xxi. pp. 117-224, Taf. i), an exhaustive paper on the *Mygalides* (*Theraphoses*, Walck.), gives an alphabetical list of 74 publications, in which Spiders of this group are either specially or incidentally treated of; also an analytical review of the 47 genera and subgenera of the author's *Theraphosoidæ*. Detailed characters are also given of the families, subfamilies, genera, subgenera, and 137 species referable to them, with a list of 37 additional species, described by various authors, but of which the systematic position is uncertain. Although, perhaps, many of the author's groups are scarcely entitled to generic rank, this paper is a bold and successful attempt to break up into useful working groups a now numerous and hitherto unwieldy family of *Araneidea*. Reference can only be made to the paper itself for the characters of the two families (and, indeed, for details generally), owing to their length and minuteness).

The author divides the *Theraphosides* (= *Territellariæ*, Thor.) into two sections, comprising in section A the family *Catadysoidæ*, and in section B *Lyphistioideæ* and *Theraphosoidæ* (Thor.). This latter is divided into three subfamilies—*Atypinæ* (Thor.), *Eriodontinæ*, and *Theraphosinæ*. The *Atypinæ* consist of the genera *Pelecodon* (Dol.), *Calommata* (Luc.), and *Atypus* (Latr.); the *Eriodontinæ*, of *Eriodon* (Latr.) and *Antrodietus*, g. n., founded on a singular Spider from Alabama, *Mygale unicolor* (Hentz). The *Theraphosinæ* (which include by far the largest number of the species of the *Theraphosides*) are divided into two main groups, *ÆPYCEPHALI* and *TAPINOCEPHALI*. Each of these is again divided and subdivided into lesser groups. It will, however, be sufficient here to give the names of the genera included in each of these main groups. Of the *ÆPYCEPHALI* are the genera *Pachyloscelis* (Luc.), *Actinopus* (Perty), *Closterochilus*, *Theragretes*, *Madognatha*, *Chorizops*, *Cyclocosmia*, and *Pachylomerus*, gg. nn., *Idiops* (Perty), *Idiosoma* and *Æpycephalus*, gg. nn., *Cteniza*, Latr., *Hexops* and *Cyrtocarenum*, gg. nn., and *Cyrttauchenius* (Thor.). In the *TAPINOCEPHALI* are included *Nemesia* (Sav., Aud.), *Hexathele* and *Brachythele*, gg. nn., *Diplura*, Koch, *Macrothele*, *Idiommatæ*, *Leptopelma*, *Ischnocolus*, gg. nn. (this last is subdivided into subgenera *Ischnocolus* and *Chætopelma*), *Cyclosternum* and *Crypsidromus*, gg. nn. (the latter divided into subgenera *Crypsidromus* and *Harpaxibius*), *Chætorhombus*, g. n., *Trechona* (Koch), *Scurria* (Koch), *Tapinauchenius*, g. n., *Avicularia* (Lamarck), *Harpactica*, *Selenocosmia*, *Acanthoscurria*, gg. nn. (the latter divided into subgenera *Acanthoscurria*, *Mygalarachne*, and *Acanthopalpus*), *Eurypelma* (Koch), divided into subgenera *Lasiadora* (Koch), *Lasiocnemus*, *Homæomma*, *Eurypelma* (Koch), *Theraphosa* (Walck.). To the above genera and subgenera are referred 137 species, among them *Calommata sumatrana*, Sumatra, *Pachyloscelis picea*, Brazil, *Cteniza orientalis*, Brussa, spp. nn., *Hexops whitii* = *Cteniza hexops* (White, Australia), *Cyrtocarenum rufidens*, Port Natal, *Cyrttauchenius doleschalli* and *C. obscurus*, Sicily, spp. nn., *C. similis* (L. Koch, sp. inedit.), Saragossa, *Nemesia*

badia, Corsica, *N. macrocephala*, Palermo, *Hexathele hochstetteri*, N. Zealand, *Brachythere incerta*, Cyprus, *B. capensis*, C. G. Hope, *B. micropa*, Brussa, *Diphura longicauda*, Quito, *D. æquatorialis*, Ecuador, *D. rogenhoferi*, Brazil, *Ischnocolus gracilis*, Cyprus, *I. inermis*, Java and Sumatra, *I. doleschalli*, Brazil, *I. syriacus*, Syria, *Cyclosternum schmardæ*, Cordilleras, *Crypsidromus isabellinus*, R. Janeiro, *C. innocuus*, Havannah, *Harpaxibius striatus* and *Chaetorhombus kochi*, Venezuela, *Acanthoscurria minor*, S. America, *Mygalarachne brevipes*, Honduras, *Acanthopalpus theraphosoides* (Dol., sp. inedit.), Brazil, *Lasiadora spinipes*, Brazil, *Lasiocnemus grossus*, S. America, *Eurypelma mordax*, Texas, *E. striatipes* and *E. rubropilosa*, Brazil, spp. nn., A. Ausserer, l. c.

KIRBY ("Notes on three species of Trap-door Spiders whose nests are in the Royal Dublin Society's Collection," J. R. Dubl. Soc. vi. pp. 67-70) brings together the remarks upon Trap-door Spiders of Saunders, Brown (1756), Westwood, Barrow, and Livingstone. The species referred to by Kirby are:—*Cteniza ionica*, Saunders (Corfu); *Actinopus nidulans*, Fabr. (Jamaica); and a third, from Natal, and of which the identity appears doubtful.

A paper by Koch on "*Atypus sulzeri*, eine Würgspinne in Europa" (Zool. Gart. 1871, pp. 289-294) is noticed in Z. ges. Naturw. 1871, p. 204.

DRASSIDES.

Pythonissa lugubris, Westr., = *Gnaphosa muscorum*, L. Koch; *P. femoralis*, Westr., = *Gnaphosa bicolor*, Hahn. Thorell, Syn. Eur. Spid. pp. 190 & 191.

Drassus hunteræ and *D. diversus*, sp. nn., Montreal: Blackwall, Ann. N. H. (4) viii. pp. 432 & 433. *Drassus blackwalli*, sp. n., = *D. sericeus*, Blackw., England; *D. occidentalis*, *D. nyctelius*, and *D. macellinus*, spp. nn., Nice: Thorell, l. c. pp. 179, 184, 185. *D. rubens* (Westr.) = *D. quadripunctatus*, var. (Linn.); *D. sericeus*, Westr., = *D. quadripunctatus*, Linn.; *D. fuscus*, Westr., = *D. scutulatus*, Koch: *id.* l. c. pp. 176-181.

Melanophora tristis, Sweden, and *M. erebea*, Austria, spp. nn.; *M. subterranea*, Westr., = *M. petiveri* (Scop.) = *M. petrensis*, L. Koch, = *M. tristis*, Thorell: Thorell, l. c. pp. 194, 198. *M. petrensis*, Westr., = *M. mærens*, Thorell; *M. pusilla*, Westr., = *M. nigrita*, Fabr.: *id.* l. c. pp. 197, 199.

Micaria anea, Sudermannia (Sweden), sp. n.: Thorell, l. c. p. 175. *Micaria pulicaria*, Sund., = *Drassus micans* and *D. nitens*, Blackwall: *id.* loc. cit. p. 173.

Clubiona (Chersina) fuscula, Westr., = *C. brevipes*, Bl.; *C. pallens*, Westr., = *C. trivialis*, Koch; *C. trivialis*, Westr., = *C. borealis*, Thorell. Thorell, l. c. pp. 223-225.

DICTYNIDES.

Dictyna (Ergatis) diligens, sp. n., Blackwall, Ann. N. H. (4) viii. p. 434, Montreal; *D. ammophila*, sp. n., Menge, Preuss. Spinn. iv. p. 265, pl. 50. tab. 157, Prussia; *D. hamifera*, sp. n., Thorell, Cefv. Vet. Ak. xxix. p. 156, Greenland.

AGELENIDES.

Amaurobius atrox (Westr.) = *A. fenestralis* (Ström); *A. scopoli*, Nice, and *A. cyrilli*, Naples, spp. nn. Thorell, Syn. Eur. Spid. pp. 205 & 206.

Tegenaria civilis, Westr., = *T. derhami*, Scopoli. Thorell, *l. c.* p. 157.

Cicurina, g. n. [nearly allied to *Tegenaria*]: *C. cicur*, sp. n., Menge, Preuss. Spinn. p. 272, pl. 50. tab. 159, Prussia.

Textrix lycosina (Westr.) = *T. denticulata* (Oliv.). Thorell, *l. c.* p. 160.

Hahnina pusilla (Westr.) = *Agelena nava* (Blackw.); *H. pratensis* (Westr.) renamed *Cryphæa arietina*. Thorell, *l. c.* pp. 163, 165.

Cryphæa mirabilis, sp. n., Thorell, *l. c.* p. 166, Venice.

PHOLCIDES.¹

Pholcus forskali, Hungary, sp. n.; *P. phalangioides*, cum syn. (Blackw.), resolved into *P. phalangioides* (Reuss.) and *P. opilionoides*, Schranck. Thorell, Syn. Eur. Spid. pp. 145, 151.

BONIZZI (An. Soc. Modena, iii. p. 179) publishes an account of the generation of *Pholcus phalangioides*.

THERIDIIDES.

LUCAS, in "Note Géographique sur le *Theridium tepidariorum*, Aranéide fileuse de la tribu des Théridiides," Rev. Z. (2) xxii. pp. 143-149, remarks on the uncertainty with which Koch, Westring, Sundevall, Blackwall, Thorell, and others have assigned its original country, and considers it identical with *T. vulgare* (Hentz), common in U. S. America. The above paper is to be continued.

COUPER, Can. Ent. i. p. 57, in a paper on "Spiders' nests," describes the nests of three species of *Theridium*.

Theridium minimum (Westr.) renamed *T. ohlerti*; *T. serratipes* (Westr.) = *Asagena phalerata* (Panz.); *T. hamatum* (Westr.) = *T. versutum* (Bl.); *T. albomaculatum* (Westr.) = *Aranea corollata* (Linn.): Thorell, Syn. Eur. Spid. pp. 85-92. *T. brachiatum*, sp. n., *id. l. c.* p. 145, Sweden.

Erigone longipalpis (Westr.) = *Neriene longipalpis* and *E. atra* (Blackw. pt.); *E. vagabunda* (Westr.) = *N. atra* and *N. longipalpis* (Blackw. pt.); *E. longimana* (Westr.) = *N. vagans* (Blackw.); *E. scabristernis* (Westr.) = *N. nigra* (Blackw.); *E. (Theridium, Reuss, Wider, pt.) cristatum* (*id.*) renamed *E. perforata* (♂ new to science); *E. bicornis* (Westr.) = *Walckenaera cristata* (Blackw.); *E. conica* (Westr.) = *W. frontata* (Blackw.) + *Micrhyphantes conifer* (Ohlert) + *Phalops conicus* (Menge); *E. parallela* (Westr.) renamed *E. reussii*; *E. acuminata* (Westr.) = *Walckenaera altifrons* (Cambr.); *E. gibbicollis* (Westr.) = *Neriene apicata* (Blackw.); *E. coriacea* (Westr.) = *W. hiemalis* (Blackw.); *E. impolita* (Westr.) = *W. obscura* (Blackw.); *E. subæqualis* (Westr.) = *W. fortuita* (Cambr.); *E. retusa* (Westr.) = *Neriene elevata* (Cambr.) + *Tmeticus foveolatus* (Menge); *E. simplex* (Westr.) = *N. agrestis* (Blackw.) + *N. fusca* (*id.*) + *Microneta tessellata* (Menge); *E. æqualis* (Westr.) = *Bathhyphantes brevipalpus* (Menge); *E. quisquiliarum* (Westr.) = *N. viaria* (Bl.); *E. rurestris* (Westr.) = *Micrhyphantes fuscipalpis* (Koch) + *N. gracilis* and *N. flavipes* (Blackw.); *E. penicillata* (Westr.) = *Neriene corticea* (Cambr.) + *Micrhyphantes cristatopalpus* (Ohlert): Thorell, *l. c.* pp. 98-141. *Erigone decens*, Germany, p. 128, *E. synophrys*, p. 139, and *E. mordens*, p. 144, Sweden: *id. l. c.* spp. nn. *E. holmgreni*, *E. spetsbergensis*, and *E. glacialis*, spp. nn., Thorell, Gëfv. Vet. Ak. xxviii. pp. 691-694, Spitsbergen. *E.*

frigida, *E. vaginata*, and *E. modesta*, spp. nn., *id. l. c.* xxix. pp. 152-154, Greenland.

Linyphia affinis (Westr.) = *L. luteola* + *L. alticeps* (Blackw. nec Sund.) + *Bolyphantes stramineus* (Menge); *L. pygmaea* (Westr.) = *L. tenebricola* (Reuss) + *L. terricola* (Blackw.) + *L. tenuis* (*id.*); *L. gracilis* (Westr.) = *Neriere variegata* (Blackw.); *L. dorsalis* (Reuss) = *L. claytonia* (Bl.): *id. l. c.* pp. 63-71. *L. sobria*, sp. n., Thorell, Cefv. Vet. Ak. xxviii. p. 688, Spitsbergen.

Ulesanis, g. n. [allied to *Phoroneidia*, Westwood]: *U. personata*, Upolu, and *U. chelys*, Viti Levu, spp. nn., L. Koch, Arachn. Austr. pp. 242-245; pl. xx. figs. 3, 4.

Centropelma, g. n. [allied to *Theridium*?]: *C. bicolor*, New Holland, *id. l. c.* p. 246, pl. xx. fig. 5.

GASTERACANTHIDES.

Peniza europaea, sp. n., Ausserer, Verh. z.-b. Wien, xxi. p. 818, Taf. v. fig. 4, Italy and Corfu.

Cyrtarachne verrucosa, Upolu, *C. rubicunda*, Sydney, spp. nn., L. Koch, *l. c.* pp. 16-18, Taf. ii. fig. 1; *C. speciosa*, Bowen, sp. n., *id. l. c.* p. 202, Taf. xviii. fig. 3.

Tholia, g. n. [closely allied to *Peniza* and *Cyrtarachne*]: *T. testudinea*, Port Mackay, and *T. clypeata*, Australia?, spp. nn., L. Koch, *l. c.* pp. 19-23, Taf. ii. figs. 2, 4; and *T. testudinea*, Bowen, *id. l. c.* p. 204, Taf. xviii. fig. 4.

Gasteracantha violenta, New Guinea, *G. mollusca*, New Caledonia, *G. hepatica*, Sumatra and Java, *G. suminata*, Viti Levu, *G. lugubris* and *astrigera*, Sydney, N. H., spp. nn.: L. Koch, Arachn. Austr. pp. 5-14, Taf. i. figs. 3, 4, 5, 7, 8, 9. *G. sacerdotalis*, Bowen, *G. mastoidea*, Viti Levu, spp. nn., *id. l. c.* pp. 199-201, Taf. xviii. figs. 1, 2.

EPEIRIDES.

Zilla keyserlingi, Dalmatia, *Z. thorelli*, Vienna, spp. nn., Ausserer, *l. c.* p. 830, Taf. v. figs. 10 & 11. *Z. straxmi* (Thorell) = *Z. montana* (L. Koch), *Z. montana* (C. Koch) = *Z. alpina* (L. Koch): Ausserer, *l. c.* pp. 831 & 832. *Z. kochi* and *rossii*, Nice, spp. nn., Thorell, Syn. Eur. Spid. p. 33.

Cyrtophora argentea, Corfu, sp. n., Ausserer, *l. c.* p. 821, Taf. v. fig. 8. *C. hirta*, *C. parnasia*, and *C. sculptilis*, spp. nn., Koch, *l. c.* pp. 125-128, Taf. ix. figs. 7, 8, 9, Pt. Denison.

Anepsia, g. n. [closely allied to *Epeira*]. Type *A. rhomboides*, Upolu (L. Koch). L. Koch, *l. c.* pp. 45, 46, Taf. iii. fig. 8.

Epeira trigona, Port Mackay, *E. heroine* and *E. bispicata*, New Holland, *E. capitalis*, Ovalau, *E. extuberata*, New Zealand, *E. nigropunctata* and *E. indagatrix*, Port Mackay, *E. plebeia*, Viti Isles, *E. corbita*, Upolu, *E. undata*, New Zealand, *E. mucronata* and *E. tenella*, New Holland, *E. maculaticeps*, Upolu, *E. flavopunctata*, Viti Isles, *E. speculabunda*, Rockhampton, *E. cordiformis*, Port Mackay, *E. albida*, Rockhampton, *E. hieroglyphica*, Viti Isles, *E. nephilina*, Port Mackay, *E. imusta*, Port Denison, *E. dimidiata*, *E. interjecta*, and *E. melanopyga*, Port Mackay, *E. graeffii*, Wollongong and Bowen, *E. melania*, Port Denison, *E. novicula*, Sydney, *E. phthisica*, *E. tabida*, and *E. acuminata*, Port Mackay, *E. fuliginata*, Sydney, *E. praesignis*, Port Denison,

E. strangulata, Viti Isles, Upolu, *E. higginsii*, Darling Downs, *E. feredayi*, Canterbury, N. Z.: spp. nn., Koch, *l. c.* pp. 50-122, Taf. iv.-xi.

Carepalxis, g. n. [allied to *Gasteracantha*]: *C. montifera*, Port Mackay, sp. n., Koch, *l. c.* p. 123, Taf. x. fig. 1.

Ebæa, g. n. [nearly allied to *Argiope*]: *E. præcineta*, Samoa Isles, *E. theridioides*, Port Mackay, spp. nn., Koch, *l. c.* pp. 130-132, Taf. x. figs. 2, 3, 4.

Meta ornata, Port Mackay, *M. prodiga*, Upolu, spp. nn., Koch, *l. c.* pp. 134-138, Taf. x. figs. 6 & 7.

Tetragnatha margaritata, Port Mackay, *T. ferox*, Bowen, Port Mackay, and Rockhampton; *T. gulosa*, St. Paul and New Zealand, *T. lupata*, Port Mackay and Bowen, *T. conica* and *T. demissa*, Bowen, *T. gemmata*, Port Mackay, *T. panopea*, Samoa Isles, *T. laqueata*, Upolu, *T. macilenta*, Samoa Isles &c.: spp. nn., Koch, *l. c.* pp. 172-192, Taf. xiv. fig. 3, Taf. xvi. fig. 6. *T. grænländica*, Greenland, sp. n., Thorell, Cefv. Vet. Ak. xxix. p. 151. *T. cabindaæ*, Cabinda, sp. n., F. de B. Capello, Journ. Sc. Lisb. i. pp. 86, 87, pl. ii. fig. 5.

Ischalea, g. n. [closely allied to *Tetragnatha*]: *I. spinipes*, sp. n., Koch, *l. c.* pp. 196, 197, Taf. xvii. fig. 4, N. Zealand.

Nephilengys, g. n. [closely allied to *Nephila*]: *N. schmeltzi*, Philippine Islands, *N. hofmanni*, Borneo, spp. nn., Koch, *l. c.* pp. 143-145, Taf. xi. figs. 7 & 8.

Nephila (*Nephilengys*, Koch) *rivulata*, Natal, Brazil, Ceylon, Labuan, sp. n., Cambridge, P. Z. S. 1871, p. 618, pl. xlix. figs. 1, 2. *N. proluxa*, Fiji Islands &c., *N. victorialis* and *nigritarsis*, Rockhampton, *N. flagellans*, Tonga Island &c., *N. pecuniosa*, Philippines, *N. imperatrix*, *N. aurosa*, *N. procera*, *N. sulphurea*, and *N. tenuipes*, Port Mackay: spp. nn., Koch, *l. c.* pp. 149-165, Taf. xii. fig. 2, Taf. xiii. fig. 5, *N. chrysogaster* (Walck.), ♂ new to science, Ceylon, Cambridge, P. Z. S. 1871, p. 618, pl. xlix. figs. 3, 4. *N. aubryi* (Luc.) = *N. grayi* (Bl.) + *N. keyserlingi*?, *id.*, F. de B. Capello, Journ. Sc. Lisb. i. p. 79 *et seq.*

Mastigosoma, g. n. [allied to *Argiope* (Sav.), *Cyphagogus* (Günther), and *Arachnura* (Vins.)?]: *M. idæ*, sp. n., Ausserer, *l. c.* pp. 2 & 3, Taf. v. figs. 1-3, Borneo.

Argiope sericea (Sav.), var. *a*, *caboverdiana*, = *A. clarki* (Blackw.) + *A. splendidus* (Sav.) + *Epeira splendida* (Walck.); var. *b*, *zairiensis*, = *A. caudata*, Bl. [?]: F. de B. Capello, Journ. Sc. Lisb. i. pp. 86, 87. *A. magnifica*, Port Mackay &c., *A. carinata*, New Holland, *A. ocyaloides* and *A. picta*, Port Mackay, *A. succincta*, Borneo, *A. gorgonea*, *A. regalis*, Port Mackay, *A. chrysorrhæa*, Pelew Island, *A. pentagona*, Ovalau: spp. nn., Koch, *l. c.* pp. 27-39, Taf. ii. fig. 6. *Argiope* — ?, Viti Island, *id.* *l. c.* p. 41, Taf. iii. fig. 7. *A. principalis*, *A. lugubris*, *A. protensa*, Bowen, Pt. Denison, *A. symmatia*, *ib.* and New Zealand: *id.* *l. c.* pp. 207-213, Taf. xviii. figs. 5-9.

ULOBORIDES.

Uloborus tenellus, Upolu, *U. bistratus*, *ibid.* and Ovalau, *U. tenuissimus*, Upolu, *U. gibbosus*, *ib.* and Ovalau, *U. barbipes*, Port Mackay: spp. nn., Koch, *l. c.* pp. 220-229, Taf. xvii. fig. 5, Taf. xix. figs. 4-9.

THLAOSOMATIDES.

Calænina (Thorell) = *Thlaosoma* (Cambridge). [The former name has the precedence.] Cf. Koch, *l. c.* p. 231.

STEPHANOPI[DI]DES.

Stephanopis (Cambridge). To the characters of this genus given by the Recorder in Ann. N. H. 1869, Bradley adds, "Legs certainly laterigrade." Tr. Ent. Soc. N. S. W. ii. p. 233. Cf. Zool. Rec. vi. p. 219, on this genus.

S. cambridgii [nec Thorell, Öfv. Vet. Ak. xxvii. p. 378], Sydney, N. H.; *S. monticola*, New England, *S. tuberculata*, Sydney, *S. depressa*, *S. elongata*, and *S. thomisoides*, Cape York, *S. rufiventris*, New England, *S. macleayi*, Goulburn, New Holland: spp. nn., Bradley, Tr. Ent. Soc. N. S. W. ii. pp. 234-238.

Cryptothele, g. n. [nearly allied to *Stephanopis*]: *C. verrucosa*, sp. n., Koch, l. c. pp. 238-240, Taf. xx. fig. 2 (possesses but two spinners), Upolu, &c.

ARCYIDES.

Arcys cornutus, sp. n., Koch, l. c. p. 218, Taf. xix. fig. 2, Rockhampton, N. S. W.

Koch (l. c. p. 215) removes the genus *Arcys* from the *Thomisides*, and forms of it a subfamily of the *Epeirides*.

THOMISIDES.

Thomisus (*Xysticus*) *lanio* (Westr.) described and renamed *X. impavidus*: Thorell, Syn. Eur. Spid. p. 230. *T. bivittatus* (Westr.)=*X. ulmi*, Hahn, + *T. westwoodi* (Cambr.), id. l. c. pp. 235 & 246. *T. (Xysticus) acerbus*, Nuremberg, sp. n., id. l. c. p. 237; *T. (X.) kempelmi*, Austria?, sp. n., id. l. c. p. 245; *T. (X.) ninnii*, Italy, sp. n., id. l. c. p. 246; *T. (X.) perogaster*, Bavaria and Austria, sp. n., id. l. c. p. 249; *T. (X.) pusio*, Prussia, sp. n., id. l. c. p. 256. *T. bragantius*, Duque de Bragança, sp. n., Capello, Jorn. Sc. Lisb. t. i. p. 86, pl. ii. fig. 6.

PHILODROMIDES.

Philodromus cinereus (Westr.)=*Artanes fusco-marginatus* (De Geer), Thorell, Syn. Eur. Spid. pp. 259 & 260; *P. tigrinus* (Westr.) renamed *Artanes pœcilus*, id. l. c. p. 261; *P. aureolus* and *P. cespiticolis*, Blackwall, considered to be the same species, id. l. c. p. 265; *P. griseus* (Westr.)=*P. pallidus* (Walck. nec Bl.), id. l. c. pp. 268 & 269; *P. cespiticolis* (Westr.)=*P. auronitens* (Auss.) and *P. fuscomarginatus* (Sund.), id. l. c. p. 266; *P. obscurus*, Montreal, sp. n., Blackwall, Ann. N. H. (4) viii. p. 431.

Thanatus arcticus, sp. n., Thorell, Öfv. Vet. Ak. xxix. p. 157, Greenland.

LYCOSIDES.

HARRIS (Ent. Corr. pp. 3, 4, 37) describes, figures, and gives an account of the habits of, but does not name, a species of *Dolomedes*.

PECK (Amer. Nat. iii. p. 50) notices the habits of *Lycosa* in carrying its young on its back.

Lycosa. Thorell (Syn. Eur. Spid.) indicates the following synonymy &c. and spp. nn.:—*L. arenaria* (Westr.)=*agricola* (Thor.)+*fluviatilis* (Blackw.), p. 278; *L. albolimbata* (Westr.)=*herbigrada* (Blackw.), p. 282; *L. saccigera* (Westr.)=*nigriceps* (Thor.)+*monticola* (Walck.)+*congener* (Cambr.), p. 283; *L. tarsalis* (Westr.)=*palustris* (Linn.)+*exigua* (Blackw. ad part.), p. 288; *L. amentata* (Westr.)=*saccata* (Blackw.), p. 298; *L. pullata* (Westr.)=*obscura*

(Blackw.), p. 306; *L. barbipes* (Westr.)=*andrenivora* (Walck. & Blackw.), p. 318; *L. pulverulenta* (Westr.)=*rapax* (Blackw.), p. 328; *L. leopardus* (Westr.)=*cambrica* (Blackw.), p. 331; *L. cinerea* (Westr.)=*aliodroma* (Blackw.), p. 332; *L. piscatoria* (Westr. & Clerck) = *degreyi* (Camb.), p. 339; *L. piscatoria* (Blackw.) is renamed *hypophila*, p. 343; spp. nn. *L. lapponica*, Lapland, p. 273; *L. hyperborea*, Scandinavia, p. 293; *L. norvegica*, Norway, p. 296; *L. longipes*, Bavaria, p. 297; *L. annulata*, Italy and France, p. 299; *L. strenua*, Italy, p. 302.

Lycosa (*Aranea*) *saccata* (Fabr.), renamed *L. grœnlandica* (Thor. Syn. Eur. Spid. p. 300), is redescribed at length by Thorell, (Efv. Vet. Ak. xxix. pp. 157 & 158; *L. glacialis*, p. 159, and *L. (Trochosa, Koch) insignita*, p. 160, Greenland, spp. nn., *id. l. c.*

SPHASIDES.

Sphasus lineatus (Westr.)=*Oxyopes ramosus* (Panz.), Thorell, Syn. Eur. Spid. p. 350. The confused synonymy of *S. lineatus* and *S. variegatus* of various authors is fully described, *id. l. c.* pp. 351-355. *S. (Oxyopus) dentatus*, Hungary (Fiume), sp. n., *id. l. c.* p. 354.

SALTICIDES.

SIMON, in his "Révision des Attidæ Européens, Supplément à la Monographie des Attides" (Attidæ, Sund.), Ann. Soc. Ent. Fr. (4) x. pp. 125-230, 329-360, makes some interesting remarks on the structure and character of the hairs forming the pubescence on the bodies of this family.—*Marpissus hamatus* (Sim.) is changed to *radiatus* (Grube); *M. pomatius* (Walck.)=*Attus strigipes* (Westr.); *M. tæniatus* (Sim.) is renamed *cinereotæniatus*: pp. 128 & 131. *M. longiusculus*, sp. n., p. 131, Ukraine. The ♂ of *M. nivoyi* (Lucas) is described as new to science, p. 132.

Attus is divided into 18 groups, p. 134. [These are characterized at length, but cannot be so given or usefully abstracted here.] *A. eurinus*, sp. n., p. 135, Rhodes; *A. argenteolineatus* (Sim.)=*imperialis* (W. Rossi)+*A. regillus* (L. Koch), p. 142; *A. wagæ*, sp. n., p. 148, Ukraine and Crimea; *A. riparius* (Sim. Monogr.) changed to *atellanus* (C. Koch)=*caricis* (Westr.)+*riparius* (Sim.), p. 150; *A. mustellatus* (Sim. Monogr.) is changed to *œruginosus* (Sim.) [conf. Sim. Monogr. p. 257], p. 154; *A. blandus*, sp. n., p. 155, Rhodes; *A. univittatus*, sp. n., p. 156, Arcachon; *A. spinicrus*, sp. n., p. 157, Morocco; *A. pulex* (Sim.) is renamed *pusio*, p. 161; *A. frontosus*, p. 166, and *affuber*, p. 170, spp. nn., Corsica; *A. laniger* (Sim.)=*bimaculatus* (Sim.), p. 171; *A. pictilis*, sp. n., p. 172, Ajaccio; *A. congener*, sp. n., substituted for *nebulosus* (Koch, Sim. Monogr.), p. 184; *A. bombycius* (Sim. Monogr. p. 111)=*hustatus* (Clerck); *A. hastatus* (Sim. Monogr. p. 110, nec Clerck) is renamed *bombycius*, p. 192; *A. paykulli* (Sav.)=*S. vaillanti* (Luc.), p. 193; *A. mitratus* (L. Koch)=*jucundus* (Luc.), p. 194; *A. finitimus* (Sim.)=*difficilis* ♀ (Sim.), p. 198; *A. sulphureus* (L. Koch, Sim. Monogr. p. 130) is renamed *sulphureociliatus*, p. 203; *A. acripes* (nearly resembling *gambosus*, Sim.), sp. n., p. 203, Corsica; *A. coccociliatus* (Cambr.)=*petrensis* (C. Koch), p. 204; *A. manicatus*, sp. n., p. 205, Morocco; *A. astutus*, sp. n., p. 206, Fez; *A. herbigradus*, p. 207, *A. terrestris*, p. 209, *A. ludio*, p. 210, *A. bahiulus*, p. 212, spp. nn., Corsica; *A. scriptus* (Sim. Monogr.)=*Salticus blandus* (Blackw.), p. 215; *A. comptulus*, p. 216, *A. luteolineatus*, p. 217, *A. muticus*, p. 220, *A. levis*, p. 221, spp. nn., Corsica; *A.*

pareus (Sim.)=*albobimaculatus* (Luc.), p. 223; *A. albibarbis*, sp. n., p. 225, Fez; *A. amadillo*, sp. n., p. 227, Corsica; *A. segnipes* (Sim.)=*biimpressus* (Doleschall), p. 229.

Attus strigipes (Westr.)=*A. radiata* (Grube) + *Marpissus hamatus* (Sim. Monogr.), Thorell, Syn. Eur. Spid. p. 368. *A. petrensis* (Westr. & Koch)=*Salticus coccoecilatus* (Cambr.), *id. l. c.* p. 374. *A. (Salticus) collingwoodi*, Labuan, sp. n., Cambridge, P. Z. S. 1871, p. 621, pl. xlix. fig. 5.

Attus. Taczanowski (Hor. Ent. Ross. viii.) describes the following spp. nn.: —*A. (Rhanis, Koch) jelskii*, Guiana, p. 34, tab. iii. fig. 1; *A. longimanus*, Cayenne, p. 36, tab. iii. fig. 2; *A. verreauxi*, Guiana, p. 37; *A. minutus*, Cayenne, p. 39; *A. wagei*, Guiana, p. 41, tab. iii. fig. 3; *A. lethierryi*, Cayenne, p. 42; *A. elaterinus*, p. 44, *A. tenuis*, p. 45, *A. pederinus* and *A. solskii*, p. 47, *A. mandibularis*, p. 49, *A. auratus*, p. 51, *A. porcatus*, p. 53, *A. marmottani*, p. 55, *A. albosignatus*, p. 57, *A. trivittatus*, p. 59; *A. guianensis*, p. 61, *A. simoni*, p. 63, Guiana; *A. spinipes*, Cayenne, p. 65; *A. nassanus*, p. 67, *A. maronicus*, p. 68, *A. olivascens*, p. 70, *brandti*, p. 72, Guiana; *A. cayanus*, Cayenne, p. 73; *A. kessleri*, Guiana, p. 75; *A. planus*, p. 80, *A. quadriguttatus*, p. 81, *A. salutamus*, p. 83, *A. obscurus*, p. 84, *A. sericeus*, p. 85, *A. nigerrimus*, p. 87, *A. minaceus*, p. 88, Cayenne; *A. vaeleckii*, p. 89, *A. ornatus*, p. 93, *A. branickii*, p. 94, Guiana; *A. dybowski*, p. 96, *A. ruficeps*, p. 97, *A. rubriceps*, p. 99, *A. dryocopinus*, p. 100, *A. tricinctus*, p. 101, *A. septemguttatus*, p. 102, Cayenne; *A. deplanatus*, p. 103, *A. hamatinus*, p. 105, Guiana; *A. bubo*, Cayenne, p. 106; *A. radoszkowskii*, p. 108, *A. heliophaninus*, p. 109, *A. platycephalus*, p. 110, Guiana; *A. serfasciatus*, Cayenne, p. 112; *A. crassiceps*, Guiana, p. 113, *A. clavimanus*, Cayenne, p. 115.

Hasarius, g. n. [*Plexippus* (Koch, pt.)]: *H. (Attus) adamsoni* (Savigny), Simon, *l. c.* pp. 329 & 330.

Callietherus tenerus (Sim. Monogr.) = *Salticus mutabilis* (Lucas), *id. l. c.* p. 333; *C. affinitatis* (Cambr.) = *C. zebaneus*, ♂ (Sim. Monogr. p. 166), *id. l. c.* p. 335.

Menemerus vigoratus (Sim. Monogr.) = *Salticus semilimbatus* (Hahn), *id. l. c.* p. 337.

Heliophanus ensifer, *id. l. c.* p. 342, and *H. corsicus*, *id. l. c.* p. 344, spp. nn., Corsica; *H. fulvignathus*, E. Pyrenees, sp. n., *id. l. c.* p. 345; *H. cambridgii* = *H. cognatus* and *H. tribulosus* (Sim. Monogr.); *H. edentulus*, Corsica, sp. n., *id. l. c.* p. 351; *H. minutissimus*, Crimea, sp. n., *id. l. c.* p. 352.

Salticus myrmeciformis, Biskara, Lucas, Ann. Soc. Ent. Fr. (5) i. p. 8, pl. i. fig. 1, and *S. melanops*, Guiana, Taczanowski, Hor. Ent. Ross. viii. p. 117: spp. nn.

Janus longulus, *id. l. c.* p. 118, tab. iv. fig. 7, and *J. wankowiczii*, *id. l. c.* p. 119, tab. iii. fig. 8, Guiana; *J. cayennensis*, *id. l. c.* p. 121, and *J. subtilis*, *id. l. c.* p. 122, Cayenne; *J. atratus*, *id. l. c.* p. 123, Guiana; *J. obscurus*, *id. l. c.* p. 124, and *J. myrmeciformis*, *id. l. c.* p. 125, Cayenne; *J. lucasi*, *id. l. c.* p. 127, Guiana: spp. nn.

Jelskia, g. n. [nearly allied to *Lyssomanes* (Hentz)]: *J. longipes*, pp. 97 & 98, tab. iv. fig. 11, and *J. unicolor*, p. 131, *id. l. c.*, Guiana, spp. nn.

SCORPIONIDEA.

SCORPIONIDES.

JOUSSET ("Essai sur le venin du Scorpion," C. R. 1870, lxxi. pp. 407-411)

details various experiments upon *Scorpio occitanus* (Europe), with the object of ascertaining the effect of its poison. The following conclusions are drawn :—1, that the poison acts directly on the red globules of blood, and *only* upon them ; 2, its action is to deprive the globules of the property of self-motion ; 3, in losing this property they become agglutinated together in masses, which obstruct the entrances to the capillaries and stop circulation. The action appears to be quantitative and purely chemical.

SIMON, R. Z. (2) xxiii. pp. 51–59, 97–101, pl. 6, restores the name *Heterometrus* (Hempr. & Ehrenb.) to *Buthus* (Koch & al.), redescribes 4 known spp., and the following spp. nn.:—*H. rœseli*, coast of Guinea, and *H. swammerdami*, Hindustan, pp. 51–59, pl. 6.

PSEUDOSCORPIONIDES.

METSCHNIKOFF, in his "Entwicklungsgeschichte des Chelifer" (Z. wiss. Zool. 1871, pp. 513–527, pls. xxxviii. & xxxix.), describes at length and figures the development of *Chelifer*, from the earliest embryo to birth.

PHALANGIDEA.

OPILIONIDES.

C. KOCH, Arch. f. Nat. xxxvii. pp. 52–91, in "Beiträge zur Kenntniss der Opilioniden des Mittel-Rhein-Gebietes," characterizes a new genus near *Opilio*, *Oligolophus* (p. 63), comprising *Acantholophus terricola*, C. Koch, and *O. mollis*, sp. n., p. 66, Frankfort ; and describes as spp. nn. *Cerastoma longipes*, p. 76, Frankfort, *C. dentatum*, p. 77, and *Platylophus leucophthalmus*, p. 81, Dillenburg.

CANESTRINI (Ann. Mus. Genov. ii. pp. 5–48, t. i.–iii.) records 27 spp. of various genera of Italian *Opilionides*, describing as new *Ischyropsalis dentipalpis*, p. 9, Apennines, *Homalonotus depressus*, p. 24, Spezzia.

ACARIDEA.

HANWELL, in Sc. Goss. 1870, p. 99, notes (and figures) an unnamed species of *Acaridea* as parasitic in the larval state upon a sandfly, which Walker (*ibid.*) determines to be either *Actora æstivum* or *Cælopa frigida*.

RONDANI, L. L'Acaro del baco di Seta, e l'Acaro del Gelso. Giorn. Agric. d'Ital. xiii. This the Recorder has not seen.

THOMAS (Sep. Abdr. Verh. St. Gall. Ges. 1870–71, pp. 1–16) continues his notices of Swiss *Phytopti*, with remarks on plants affected by them.

DONNADIEU, in "Recherches Anatomiques et Zoologiques sur le genre *Trichodactyle*," Ann. Sc. Nat. (5) x. pp. 69–5, 1 pl., treats under "Considérations Générales" of the systematic position of the genus *Trichodactylus* (Duf.), and reviews the works of previous authors upon it. Under "Anatomie" the external (but not internal) structure is minutely gone into. The genus is then concisely characterized, and two species (including *T. xylocopæ*, sp. n., France?) are described ; both are figured, and numerous dissections given, showing various peculiarities of structure.

The same author, Journ. de Zool. pp. 45–52, supposes the *Acarus* causing the *Erinosis* of the vine to be the larva of a species of *Dermanyssus*.

C. J. GIEBEL, "Ueber einige Milben," Z. ges. Naturw. iv. pp. 29–32, Taf. i.–iii., figures 12 known species of *Hypoderus*, 1 of *Sarcopterus*, and 1 of *Dermanyssus*, *D. nitzschi*, sp. n., from the nostrils of *Caprimulgus europæus*.

The same author (*l. c.* iii. pp. 490–498, Taf. v.), “Ueber die Federmilben-gattung *Analges* (Nitzsch),” describes and notices 17 species (parasitic on various birds), of which the following are new:—*A. serratilobatus*, on *Picus major*; *A. crassipes*, on *Phaeton phœnicurus*; *A. setifer*, on *Phasianus colchicus*; *A. pachynemis*, on *Motacilla alba*; *A. integer*, on *Lanius excubitor*; *A. spiniger*, on *Sylvia hypoleis*; *A. bidentatus*, on *Accentor modularis*; *A.* —?, on *Sitta europæa*; *A. bilobatus*, on *Gallinula chloropus*; *A. acanthurus* and *A. socialis*.

ACARIDES.

Dermalichus picipubescentis, sp. n., Packard, Guide, &c. p. 662.

ORIBATIDES.

Oribata notata, sp. n., Thorell, Cefv. Sv. Ak. xxviii. p. 695, Spitsbergen.

Eremæus lineatus, sp. n., *id. l. c.* p. 696, Spitsbergen.

Nothrus borealis, sp. n., *id. l. c.* p. 697, Spitsbergen; *N. ovivorus*, sp. n., Packard, *l. c.* p. 662.

Hermannia reticulata, sp. n., Thorell, *l. c.* p. 697, Spitsbergen.

IXODIDES.

WRIGHT (Amer. Nat. iii. p. 51) notices the habits of the “Cattle Tick.”

RUDOW (“Einige neue Ixoden,” Z. ges. Naturw. 1870, pp. 14–20) describes *Amblyomma iguanæ* (Fabr.), also *A. cordatum*, *A. bengalensis*, *Hyalocrura spinosa*, Asia, *H. varani*, *Dermacentor planus*, *Rhipi[do]cephalus niger*, spp. nn.

BDELLIDES.

Bdella arctica and *B. decipiens*, spp. nn., Spitsbergen. Thorell, *l. c.* pp. 498 & 499.

B. arctica (Thor.)=*Acarus longirostris* (Fabr.). *Id. l. c.* xxix. p. 161.

Cheyletus semivivorus, sp. n., Packard, *l. c.* p. 262.

TROMBIDIIDES.

THORELL, *l. c.* xxix. p. 163, indicates 2 undescribed species of *Trombidium* and *Rhyncholophus* from Greenland.

Rhagidea, g. n., & *R. gelida*, sp. n., *id. l. c.* xxviii. pp. 700 & 701, Spitsbergen.

Penthaleus insulanus, sp. n., *id. ibid.* p. 702, Spitsbergen.

Trombidium hyperboreum, sp. n., *id. l. c.* xxix. p. 162, Greenland.

HYDRACHNIDES.

C. J. NEUMAN, *ibid.* xxvii. pp. 105–110, gives a list, with localities, of the West Gothland species.

Limnesia pardina and *marmorata*, spp. nn., *id. l. c.* p. 109, W. Gothland.

Hygrobatas fabricii, sp. n., Thorell, *l. c.* pp. 163 & 164, Greenland.

GAMASIDES.

Dermanyssus avium, found on Canaries: Lang & Barnesby, Ent. v. p. 280.

Dermanyssus ambulans, sp. n., Thorell, *l. c.* pp. 164 & 165, Greenland.

MYRIOPODA.

BY

The Rev. O. P. CAMBRIDGE, M.A., C.M.Z.S.

GRIMM, OSCAR. Beiträge zur Lehre von der Fortpflanzung und Entwicklung der Arthropoden. Mém. Pétersb. (7) xvii.—Part II.

Treats of the propagation and development of *Tyroglyphus siro*, pp. 4-9, Taf. i. figs. 10-24.

PORATH, C. O. von. Om några Myriopoder från Azorerna. Öfv. Vet. Ak. xxvii. pp. 813-823, Taf. x.

Describes 9 species, of which 4 are new.

STUXBERG, ANTON. Bidrag till Skandinaviens Myriopodologi. I. Sveriges Chilognather. *Tom. cit.* pp. 891-915.

Tabulates the species of the genus *Iulus*, and describes 18 known species of that and other genera. The synonymy of the different species appears to be fully and carefully worked out.

——. Bidrag till Skandinaviens Myriopodologi. II. Sveriges Chilopoder. *Op. cit.* xxviii. pp. 493-512.

Gives a list of 16 known species of various genera, and divides *Lithobius* into 5 groups. The synonymy of the different species is worked out as in the former paper on *Chilognatha*. At the end of each paper is a list showing the distribution of species in Sweden and Denmark respectively.

CHILOGNATHA.

Polydesmus coriaceus and *Iulus propinquus*, spp. nn., Porath, *l. c.* pp. 819-822, Taf. x. figs. 7, 11, 12, Azores.

Spirostrephon (*Pseudotremia*) *copii*, sp. n., Packard, Amer. Nat. v. p. 748, Mammoth Cave, Kentucky, U. S. A.

CHILOPODA.

Lithobius longipes and *Geophilus hirsutus*, spp. nn., Porath, *l. c.* pp. 816 & 817, Taf. x. figs. 1-6, Azores.

INSECTA.

THE GENERAL SUBJECT

By E. C. RYE.

ASSMAN, AUG. Palaeontologie. Beiträge zur Insekten-Fauna der Vorwelt. Breslau, 1870, pp. 62, 1 pl. (Sep.-Abdr. Z. E. Ver. schles.).

After some general remarks upon fossil Insects, the author gives an account of the geological formations and localities in which they have hitherto been found. He describes, 1st, species of the tertiary (miocene) clay from Schossnitz, Kanth, viz. (*Hymenoptera*) *Lasius oblongus*, p. 38, figs. 1 & 1a, *Lonchomyrmex nigratus*, p. 39, figs. 2 & 2a, *Phidologeton schossnicensis*, p. 40, figs. 3 & 3a, (*Coleoptera*) *Curculionites silesiacus*, p. 41, figs. 4 & 4a, *Donacia letzneri*, p. 42, figs. 5 & 5a, *Goniocena primordialis*, p. 43, figs. 6 & 6a, spp. nn.; (*Orthoptera*) *Hodotermes heerianus*, Göpp.; (*Odonata*) *Libellula sieboldiana* and *pannewitziana*, Göpp., *L. kieseli*, sp. n., p. 52, figs. 10 & 10a: 2ndly, species of the tertiary (oligocene) brown-coal of Naumburg, viz. (*Col.*) *Dicerca reticulata*, p. 60 & fig., and *Anthaxia buschi*, p. 61 & fig., spp. nn.: all, it is needless to observe, from fragments of individuals.

BETHUNE, C. J. S., SAUNDERS, WILLIAM, & REED, EDMUND BAYNES. First Annual Report on the Noxious Insects of the province of Ontario, prepared for the Agricultural and Arts and Fruit-growers' Associations of Ontario, on behalf of the Entomological Society of Canada. Toronto: 1871 (pp. 65-130 of Report of the Fruit-growers' Association of Ontario for the year 1870).

Although not separately paged, this is practically a distinct work from the Report with which it is incorporated. It contains notices of insects of all orders injurious to the apple, grape, and plum, and many woodcuts, mostly borrowed from the 'Canada Farmer' and 'American Entomologist.'

BLANCHARD, ÉMILE. Remarques sur la faune de la principauté Thibétaine du Mou-pin. C. R. lxxii. pp. 807-813.

An account of the collections of Armand David made in Thibet. In the notes, some presumably new species of *Lepidoptera* and *Coleoptera* are curtly diagnosed and named.

BREFELD, OSCAR. Untersuchungen über die Entwicklung der *Empusa muscæ* und *Empusa radicans*, und die durch sie verursachten Epidemien der Stubenfliegen und Raupen. Halle, 1871, 4to, pp. 50, pls. 4 (Sep.-Abdr. Abh. Ges. Halle, xii.).

After a review of the literature of the fungoid diseases of Insects, the author enters at some length upon the morphology and physiology of *Empusa*, resulting in the decided opinion that the fungoid growth is the cause and not the consequence of the disease. Highly magnified drawings are given of mycelium, spores, &c., in various degrees of development.

BURGESS, E. [See SCUDDER.]

BÜTSCHLI, O. Vorläufige Mittheilung über den Bau und Entwicklung der Samenfäden bei Insecten und Crustaceen. Z. wiss. Zool. xxi. pp. 402-415.

——. Nähere Mittheilungen über die Entwicklung und den Bau der Samenfäden der Insecten. *Ibid.* pp. 526-534, pls. xl. & xli.

Further contributions to protoplasmic literature, treating of spermatozoa of *Agriön puella*, *Culopteryx virgo*, *Hydrophilus piceus*, *Clythra octomaculata*, *Blatta orientalis*, and *Gammarus pulex*.

COOKE, M. C. Vesicating Insects. Pharm. J. & Tr. (3) pp. 101, 141, 181, 261, 321, 383, 423, 503, 521.

The parts published in 1871 discuss the *Mylabridæ*, *Cantharidæ*, and *Meloidæ*; but other insects used as "substitutes" or "adulterating-agents" are intended to be included in the work. Woodcuts are given of most of the spp. described; and the observations consist of (chiefly reproduced) descriptions of all the spp. reputed to be vesicating, with references to authorities and general remarks; but the only practically useful feature in such a compilation, viz. an analysis or a reference to the respective proportions of the active blistering principle contained in each species, is omitted.

DARWIN, CHARLES. Secondary sexual characters of Insects. (Chapters x. & xi. pp. 341-423, of the author's 'Descent of Man.' London: 1871.)

In discussing the argument of sexual selection, the author, after referring, amongst other instances, to the diversified structures possessed by the males of the *Insecta* for seizing the females, the differences between sexes of which the meaning is not understood, and especially the difference in size between the sexes, and briefly referring to sexual distinctions, &c. in the *Thysanura*, *Diptera*, Heteropterous and Homopterous *Hemiptera* (especially the musical powers possessed by the males alone in the latter suborder), enters at some length upon the pugnacity, colours, and structurally much-diversified musical instruments of the males of the *Orthoptera*, the colour-differences in the *Neuroptera*, the pugnacity and colours of the *Hymenoptera*, the colours, pugnacity, and horny developments of the males, and the possession of stridulating organs by both sexes of the *Coleoptera*, and the various well-known sexual mo-

difications of the *Lepidoptera*. Observations on the proportional numbers of the sexes in the *Insecta* occur at p. 309 *et seq.* Many woodcuts of various sexual developments in the different orders are given, and are mostly original; and the author's usual accuracy and earnest endeavour to get at truth, independently of theory, are as conspicuous in this collateral branch of his argument as in his more pretentious works.

DEI, APELLE. Utilità dell' Entomologia applicata all' Agricoltura. Bull. Ent. Ital. iii. pp. 67-80.

General observations on applied entomology, more especially referring to insect-parasites.

——. Sui danni degli Insetti nelle Campagne Senesi durante l'anno 1871. *L. c.* pp. 360-365.

Remarks on injuries caused near Sienna by insects.

DIETZE, CARL. Ueber einige Beispiele von Nachahmung bei Insecten. *S. E. Z.* xxxii. pp. 279-284.

General observations on the similarity of appearance in different species, chiefly *Lepidoptera*.

DIMMOCK, GEORGE. Catalogue of Coleoptera and Lepidoptera. Springfield, Massachusetts: 1871.

GERSTAECKER, A. Beitrag zur Insektenfauna von Zanzibar. *Arch. f. Nat.* xxxvii. III. *Coleoptera*, pp. 42-86, 345-349. IV. *Hymenoptera*, pp. 349-357. V. *Lepidoptera*, pp. 357-361. VI. *Diptera*, pp. 362 & 363.

Continued from vol. xxxiii. p. 49. Some new genera and many new spp. are characterized.

GLASER, L. Die schädlichen Obst- und Weinstock-insekten und die zu deren Vertilgung dienenden Mittel. Darmstadt: 1871, 8vo, pp. 48, 4 pls.

Published under the auspices of the Obst- und Weinbau Verein of Darmstadt. A practical treatise.

GLOVER, TOWNEND. "Report of the Entomologist and Curator of the Museum:" in the "Report of the Commissioner of Agriculture for the year 1870." Washington: 1871, pp. 65-91, 60 woodcuts.

A semipopular account of noxious American insects of all orders.

KÖPPEN, FR. TH. Einige Fälle von Massen-Erscheinen verschiedener Insecten, und speziell der Libellen. *S. E. Z.* xxxii. pp. 183-190.

A brief compilation of accounts of swarms of insects (chiefly *Libellulidae*) observed since 1494.

KOWALEWSKI, A. Embryologische Studien an Würmern und Arthropoden. *Mém. Pétersb.* xvi. 12, pp. 70, pls. 12.

The 2nd part of this excellent treatise consists of accounts of, 1 (pp. 31-44,

pls. viii., ix. & x.), the development of *Hydrophilus piceus*, of which the author discusses three separate embryonic periods, figuring 17 stages of the embryo, with highly magnified sections of different portions of its structure, and the larva; 2 (pp. 44-53, pls. xi. & xii. figs. 19-30), the like development, from the earliest perceptible germ, of *Apis mellifica*; 3 (pp. 53-56, pl. xii. figs. 1-10), a sketch of the like development in various *Lepidoptera*; and, 4 (pp. 56-60), general observations on the development of the *Insecta*.

KÜNSTLER, GUSTAV. Die unseren Kulturpflanzen schädlichen Insekten. Verh. z.-b. Wien, xxi. (Beih.) pp. 96.

In this practical little treatise, compiled for the use of agriculturists, the author discusses some 150 species of all orders, known to destroy cultivated plants. Especial stress is laid upon the indications of injuries by insects, and the stages in which they are most destructive, with suggestions of remedies.

LABOULBÈNE, ALEXANDRE. Observations sur des Noix véreuses et sur les Insectes qui les habitent. Ann. Soc. Ent. Fr. (5) i. pp. 295-298.

Treats of *Siphonella nucis*, Perr. (Dipt.), and *Curpocapsa pomonana*, Hübner. (Lep.).

LEYDIG, F. Beiträge und Bemerkungen zur württembergischen Fauna mit theilweisem Hinblick auf andere deutsche Gegenden. Württ. JH. xxvii. pp. 199-271.

Part vi., relating to the *Insecta* (pp. 243-265, and p. 271), adds many spp. of *Coleoptera* to Steudel's list; a few *Hymenoptera*, *Diptera*, *Hemiptera* (notably *Fulgora europæa*), *Orthoptera* (especially *Mantis religiosa*), and *Neuroptera* are also mentioned.

LOWNE, B. T. Observations on Immature sexuality and Alternate Generation in Insects. Tr. E. Soc. 1871, pp. 193-202.

Chiefly from having observed the larvæ of certain *Orthoptera* copulating, the author believes in a visible transition from a winged to a wingless mature form, repudiating the idea of an ancestral larval form. At p. 202 is a table of his views concerning the various larval forms in the *Annulosa* and *Annuloida*. The phenomena of wingless females and of dermal appendages in the males are considered to be purely sexual, though not produced by selection.

LUBBOCK, Sir JOHN. On the origin of Insects. P. L. S. xi. pp. 422-425.

A brief summary of the recorded opinions as to the "stem-form" of the *Insecta*, on the Darwinian hypothesis. The author agrees with Brauer in considering *Campodea* as the form most nearly approaching to this ideal, remarking that it is the living representative of a primæval type, from which not only the *Collembola* (*Podura* &c.) and *Thysanura*, but the other great orders of the *Insecta*, have all derived their origin. (Cf. Wallace's Presidential Address, Pr. E. Soc. 1871, p. lxix *et seq.*; Beale, Nature, v. pp. 63 & 142; Lowne, *ibid.* p. 101.)

M'INTIRE, S. J. Notes on the minute structure of the scales of certain Insects. M. Micr. J. v. pp. 3-13, pls. lxi.-lxxi.

Scales of *Scenicus salticus*, *Hypomeces squamosus*, *Polyxenus lagurus*, *Procris statice*, *Urania leilus*, *Culex pipiens*, *Attagenus pellio*, *Cyphus germari*, *Pieris epicharis* and *agathina*, *Macrotoma major*, *Polyommatus* and *Petrobius* are minutely described and figured, chiefly as regards their respective values as test-objects for lenses.

MARSHALL, T. A. Notes on some Corsican Insects. Ent. M. M. vii. pp. 225-228, 248-250.

A list, with localities, of the principal species of *Coleoptera* and *Orthoptera* found in Corsica.

MONCREAFF, HENRY. Notes on Gall-makers and their Parasites. Ent. v. pp. 239 & 240.

Walker publishes further observations by Moncreaff, *ibid.* pp. 450 & 451.

MOORE, FREDERIC, WALKER, FRANCIS, & SMITH, FREDERICK. Descriptions of some new Insects collected by Dr. Anderson during the Expedition to Yunan. P. Z. S. 1871, pp. 244-249, pl. xviii.

Descriptions of 5 spp. nn. of *Lepidoptera* by Moore, 6 of *Orthoptera* by Walker, and 3 of *Hymenoptera* by Smith.

MÜLLER, ALBERT. On the dispersal of non-migratory Insects by atmospheric agencies. Tr. E. Soc. 1871, pp. 175-186.

After reproducing facts already recorded, the author intimates his opinion that such events are not accidental or isolated (*cf.* Pr. E. Soc. 1871, pp. v & vi for discussion on this subject).

MULSANT, E. Opuscles Entomologiques. xiv. Paris, 1870, pp. 244.

The above further instalment of this well-known publication (of which Cah. xiii. appeared so long ago as 1863), consisting, as usual, of memoirs by the author and others from Ann. Soc. L. Lyon, n. s., xvi.-xviii. (1865-1871), contains:—a complete list of Sichel's works, entomological and otherwise, p. 89 *et seq.*; descriptions of various new genera and species of *Coleoptera* and *Rhynchota* &c., already noticed in Zool. Rec., up to vol. vi.; descriptions of new genera and species of those orders by the author, in conjunction with Rey, Godart, & Pellet, and by Haliday, that will be found in the present vol.; and (absurdly misplaced in a work professing to be purely entomological) descriptions of three new spp. of Humming-birds!

NOLL, F. C. Die Erscheinungen des Parasitismus. Ber. senck. Ges. (1870-71) 1871, pp. 49-65.

Besides its indirect interest, this paper briefly refers to parasitism in *Insecta*.

NÖRDLINGER, H. Die Kenntniss der wichtigsten kleinen Feinde

der Landswirthschaft. Stuttgart: 1871, pp. 138, many woodcuts.

This practical little manual, on somewhat the same scheme as the author's larger work on the same subject, after a general and popular introduction on the affinities and divisions of *Insecta*, gives a short and intelligible account of such of them as are directly or indirectly injurious, with well executed figures of the insects themselves (usually in their most noxious stages), and of the devastation or alteration in appearance caused by them.

PACKARD, JUN., A. S. Injurious Insects, new and little known. Mass. Agr. Rep. 1870, 8vo, pp. 31, plate and woodcuts.

This work is reviewed at some length in Am. Nat. iv. pp. 684-686, where some of the figures are reproduced (pl. 6, & figs. 154-156). From that review the following new spp. of *Lepidoptera* appear to be described by Packard:—*Micropteryx pomivorella* (on apple), *Tortrix v-signatana* (cherry), *T. vaccinivorana* (yellow cranberry), *Coleophora cerasivorella* (cranberry vine), *Prionoclyda bilinearia* (oak), *Paraphia piniata* and *Parennomos piniata* (pine), and *Botys syringicola* (lilac), and, of the *Rhynchota*, *Lecanium platyceri*.

———. First Annual Report on the Injurious and Beneficial Insects of Massachusetts. Boston: 1871, 8vo, pp. 31 (extr. from Mass. Agr. Rep.).

The Recorder has not yet seen this work, reviewed in Am. Nat. v. p. 423 *et seq.*, in which some of the woodcuts are reproduced. A new sp. of *Bucculatrix*, from cedar, appears to be described in it, under the name *thuiella*.

———. On Insects inhabiting Salt Water. Am. J. Sci., Feb. 1871.

The author supplements his former paper on this subject (Zool. Rec. vii. p. 230) by publishing the results of his examination of a collection made by Torrey in Clear Lake, California. This, apart from species evidently accidentally occurring, comprised *Laccophilus decipiens* and *Berosus punctatissimus*, Lec. (*Coleopt.*), *Salda interstitialis*, Say, and *Hygrotrechus* and *Corixa*, spp. nn., described by Uhler (*Hemipt.*), an unknown sp. of *Tanypus* and of *Stratiomys*, in their earlier stages only, and an *Ephydra*, sp. n., described by Packard, who also describes another of that genus from Great Salt Lake (*Dipt.*). A larva of *Chironomus oceanicus*, Pack., found in 20-fathom water, and a new sp. of *Hydrachna* (*Arachn.*) are also recorded from Eastport, Maine. A note on the littoral habits of the English allies of *Ephydra* is given on Walker's authority.

This article is reproduced in Ann. N. H. (4) vii. p. 230 *et seq.*

PETTIGREW, JAMES BELL. On the Physiology of wings, being an Analysis of the movements by which Flight is produced in the Insect, Bat, and Bird. Tr. R. Soc. Edinb. xxvi. pp. 321-448, pls. xi.-xvi.

An exhaustive summary of the views of Borelli, Marey, Chabrier, and Strauss-Dürkheim. The plates refer exclusively to birds; but there are some woodcuts in the portion relating to the *Insecta*.

PHILIPPI, R. A. Beschreibung einiger neuer chilenischer Insekten. S. E. Z. xxxii. pp. 285-295, Taf. 3.

Contains descriptions of 2 new genera and 4 new spp. of *Hymenoptera*, 1 new sp. of *Lepidoptera*, 2 new gen. and 2 new spp. of *Diptera*, and 1 new gen. and 2 new spp. of *Coleoptera*.

PLATEAU, FÉLIX. Qu'est-ce que l'aile d'un Insecte? S. E. Z. xxxii. pp. 33-42, pl. 1.

The author deduces, from his own observations as well as those already published by others on this subject, 1, that there are no true mesothoracic or metathoracic spiracles; 2, that spiracles and wings are invariably appurtenances of the dorsal arch; 3, that a wing is an hypertrophied spiracle; and, 4, that the balancers of *Diptera* are rudimentary wings. He figures magnified dissections of the metathorax and 2nd abdominal ring of *Dytiscus marginalis*, a branchial filament of larva of *Phryganea flavicornis*, a part of the stem of a balancer of *Asilus crabroniformis*, and a balancer of *Eristalis tenax*.

REED, EDMUND BAYNES. [See BETHUNE.]

RILEY, CHARLES V. Third Annual Report on the noxious, beneficial, and other Insects of the State of Missouri. Jefferson City, Missouri: 1871, pp. 175, 73 woodcuts.

Some of the observations contained in this pamphlet have already appeared in *Am. Ent. & Bot.* (from which many of the woodcuts are borrowed), and need not be again referred to. It abounds with practical suggestions, and generally treats of economic entomology, though some few new spp. (and the earlier stages of others) are also described in it.

RONDANI, CAMILLO. Degli Insetti parassiti e delle loro vittime. Bull. Ent. Ital. iii. pp. 121-143, 217-243.

This commencement of the author's proposed catalogue of parasitic insects treats solely of *Hymenoptera*; it is an alphabetical enumeration (reaching the genus *Ichneumon*) of species of various families, with brief references to the insects which they destroy.

SABBIONI, —. Uccelli ed insetti in rapporto coll' agricoltura.

The Recorder has not seen this work, which, from notice in Bull. Ent. Ital. iii. p. 111, appears to be the report of a quasi-umpire between the opinions of Rondani (Gli uccelli e gli insetti dannosi all' agricoltura) and Calderini (La legge sulla caccia e l'opuscolo del Prof. Rondani) as to the importance of insectivorous birds.

SAUNDERS, WILLIAM. Hints to Fruit-growers. Canad. Ent. iii. pp. 12 & 13, 25-27, 66-70, 149-155.

Accounts of the economy of various well-known American insect-pests, with hints as to the means of destroying them. Some illustrations are given.

— [See BETHUNE.]

SCUDDER, S. H., & BURGESS, E. On asymmetry in the ap-

pendages of Hexapod Insects. (From P. Bost. Soc.) 1871, 8vo, pp. 24, 1 pl.

The Recorder has not yet seen this work, in which, from a review in *Am. Nat.* v. p. 420, eleven new species of *Nisoniades* (*Lep.*) are described.

SIEBOLD, CARL THEODOR ERNST VON. Beiträge zur Parthenogenesis der Arthropoden. Leipzig: 1871, pp. 238, 2 pls.

Consists of accounts and arguments upon parthenogenesis observed, i., in *Polistes*, pp. 1-101; ii., in *Vespa holsatica*, pp. 102-105; iii., in *Nematus ventricosus*, pp. 106-130; iv., in *Psyche helix*, pp. 131-144; v., in *Solenobia triquetrella* and *lichenella*, pp. 145-159; vi., in *Apus* and allied *Crustacea*, pp. 160-222 (see CRUSTACEA); and, vii., the author's conclusions from the facts recorded, pp. 223-238. These mainly are, that in consequence of the special pains taken to discover which sex is produced by parthenogenesis, it is certain that any resulting sexual variation is not accidental, but that in *Polistes*, *Vespa*, and *Nematus*, as in *Apis*, the male is thereby produced, and the female in *Cochlophora* and *Solenobia*, *Apus*, *Artemia*, and *Limmadia*.

Pl. i. contains diagrams of the condition at 4 different periods of a nest of *Polistes*, as regards the development of parthenogenetic ova; pl. ii. refers exclusively to *Apus canceriformis*.

This work is supplemented by the author in *SB. bayer. Ak.* 1871, pp. 232-242.

STAVELEY, E. F. British Insects. A familiar description of the form, structure, habits, and transformations of Insects. London: 1871, 8vo, pp. 392, 16 coloured plates, 71 woodcuts.

A general introduction, more popular than scientific, and somewhat discursive.

TARGIONI-TOZZETTI, ADOLFO. Note anatomiche intorno agli Insetti. *Bull. Ent. Ital.* iii. pp. 386-410, pl. 3.

Minute observations on the disposition, structure, and composition of the adipose tissue in larvæ of *Lamproreia noctiluca*, *Oryctes grypus*, *Cetonia*, *Cerambyx cerdo*, *Tenebrio molitor*, *Gryllotalpa vulgaris*, *Bombyx rubi* and *mori*, *Cossus*, and *Chelonia*. The author gives highly magnified figures of various cells and other component parts of this tissue in most of the above-named insects, including cysts of Gregarines in the adipose tissue of the larva of *Cetonia*.

TASCHENBERG, E. L. Entomologie für Gärtner und Gartenfreunde, etc., nebst Angabe der anzuwendenden Schutzmittel. Leipzig: 1871, 8vo, pp. 585, 123 woodcuts.

224 species of insects injurious to horticulturists are referred to (reviewed in *S. E. Z.* xxxii. p. 166 *et seq.*).

WHITE, F. BUCHANAN. On involuntary migration in Insects. *Ent. M. M.* viii. pp. 97-99.

Contains references to about 50 spp. of insects of all orders observed on the snow-fields of a Scotch mountain, none of them being hill-species proper;

also an account of the occurrence on the top of another Scotch mountain of a species of *Hemiptera*, in some numbers, far from its natural habitat.

ZOUTVEEN, H. HARTOGH HEYS VAN. Observations sur les coefficients du vol chez les Insectes. Tijdschr. Ent. (2) vi. pp. 20-26.

The author intimates an intention of extending to the *Insecta* the plan of obtaining coefficients of flight indicated by Harting in Arch. Néerl. iv., by comparing the length and extent of superficial area of the instruments of flight with the weight of the body of different species. Having upon this scheme obtained algebraic equivalents for such easily manipulated species as *Gryllotalpa vulgaris*, *Melolontha vulgaris*, *Triphaena promba*, *Smerinthus tiliae* ♂, and *Caliphora vomitoria*, he enunciates the following opinion:—"I attach a great importance to these coefficients; and I believe that a time will come when the scientific description of any flying creature will be deemed insufficient if they be not therein included."

Subsequently (*l. c.* p. 143) the author gives the results of his calculations as regards *Hydrophilus piceus* ♀ and *Gymnopternus nobilitatus* (Dipt.) ♂.

Von Vollenhoven (*ibid.*) remarks upon the influence of sex upon the calculation.

General observations on Entomology are made by Couper, in Canad. Ent. iii. pp. 32, 61.

Natural selection: some general remarks, upholding the Darwinian hypothesis, are made by Riley upon this subject in iii. Rep. Ins. Mo. pp. 159-175: cf. also Reichenbach & Gleisberg, Nunq. Ot. i. pp. 211 & 222; Henslow, Nature, v. p. 123; Davis, *ibid.* p. 161.

Defensive resources of insects: cf. Warner, Sci. Goss. 1871, pp. 248-252.

Blood-corpuscles: in Anz. Ak. Wien, viii. pp. 2-5, is an abstract of a proposed paper by Graber, under the title "Ueber das Blut und insbesondere die sogenannten Blutkörperchen der Insecten und einiger anderer Wirbellosen." The author fails to detect any cell-membrane or division of blood-corpuscles starting from the nucleus, and is convinced that the crystals in evaporated serum are not all of organic nature. Besides fat, which seems an especial characteristic constituent of the blood, the substance appears principally to contain globuline.

At p. 872 of the same Bulletin, is a short notice of another proposed paper by Graber, under the title "Kritische Untersuchungen auf dem Gebiete der Physiologie und feineren Anatomie der Insecten, und speciell der Pediculinen."

The mobility of spines on eggs (supposed to be an insect's) found on the Mallee-bird, is noted by Davis (Journ. Quek. Micr. Club, 1871, p. 141).

Galls on *Carex*: Müller (Pr. E. Soc. 1871, p. x.) briefly describes some unknown excrescences of this nature, resembling cocoons of *Nematus*.

British gall-insects: Müller (Ent. Ann. 1872, pp. 1-22) gives a summary of the recorded observations in Great Britain on gall-producing insects of all orders.

Instances of Insects in the perfect state retaining the head of the larva are referred to in Pr. E. Soc. 1871, p. ii [cf. Zool. Rec. v. p. 193].

Insects as personal ornaments: for notes on this subject, cf. Dohrn, S. E. Z. xxxii. pp. 424 & 425.

Insects used as *materia medica* in China are referred to by Porter Smith in Pharm. J. & Tr. (3) p. 4 (from 'Medical Times and Gazette'), especial remark being made on the vesicating species.

Entomological gardens : Claudon (Feuil. j. Nat. vii. 1871) publishes a note on this subject ; cf. also Macpherson, Sci. Goss. 1871, p. 190, Oborn, *ibid.* p. 234, fig. 141, and Clifford, *ibid.* pp. 267-270.

Insects in birds' nests : Douglas (Ent. M. M. viii. p. 64) translates and adds to Cornelius's notes in S. E. Z. 1869.

Insectivorous birds : von Frauenfeld (Verh. z.-b. Wien, xxi. Beih. pp. 12) expounds his reasons for endeavouring to obtain greater protection for these, laying especial stress on the natural check to injuries to cultivated plants afforded by them when unmolested [cf. AVES on this subject].

In the "Report of the Fruit-growers Association of Ontario" for the year 1870 (Toronto, 1871), are notices of damages to vines and other cultivated trees by insects of all orders, with suggestions of remedies.

Cedars injured by an unknown insect are referred to by Joannon in Proc.-verb. of Ann. Soc. Agric. Lyon (4), i. p. xcix.

Insects injurious to turnips : Bold (P. Hexh. Club, 1871, pp. 31-35) enumerates these and their remedies and parasites. This paper is reproduced by Newman, Ent. v. p. 385 *et seq.*

Geographical distribution and dispersion of Insects : Trimen (P. L. S. xi. pp. 276-284) gives instances of insects occurring at sea at long distances from land, and, in some general remarks upon Murray's theory of geographical relations (cf. Zool. Rec. vii. p. 243), is evidently inclined to consider the accidental introduction of species 'much more credible than the various schemes by which that author endeavours to corroborate his peculiar views [cf. Pr. E. Soc. 1871, p. xi *et seq.* for discussion by Wollaston, Bates, Murray, and Wallace on this subject ; also review in Am. Nat. v. p. 644].

Vogelsberg and Pfingsten : von Heyden (Ber. Off. Ver. xii. p. 42 *et seq.*) mentions insects observed during an excursion in 1867.

Madonie mountains and woods of Caronia : Ragusa (Bull. Ent. Ital. iii. pp. 366-380) gives a detailed account of insects occurring in these districts.

Alpine collecting : Frey-Gessner (Mitth. Schw. ent. Ges. iii. p. 313 *et seq.*) gives an account of his experiences in 1869 and 1870.

Cheviot district : Hardy (P. Berw. Nat. Club, 1871, pp. 251-267) gives a list of the *Insecta* (Col., Hemip., Hymenop., Dip.) and *Arachnida* observed here, with localities and a few general remarks. Cf. also Ent. M. M. vii. pp. 182-184.

Entomology in Ireland : under this heading, Stevens (Ent. v. p. 360 *et seq.*) gives a list of common species of *Coleoptera*, with brief remarks on some other orders.

Astrakan and Sarepta : Becker (Bull. Mosc. xlv. pp. 290-302), in an account of his excursion to Temir Chan Schora and Derbent, gives lists of the *Lepidoptera*, *Coleoptera* and *Hemiptera* that occurred to him, with occasional synonymy and indications of new species.

Mammoth Cave, Kentucky : Packard (Am. Nat. v. pp. 744-747, figs. 122-127) briefly refers to and figures *Anophthalmus tellkampfi*, *Adelops hirtus*, *Rhaphidophora subterranea*, an *Anthomyia*, a *Phora*, and *Campodea*, amongst other spp. found in this cave. He reproduces and comments upon Schiödt's observations on cave-insects.

Wyandotte Cave : Cope, in Indianapolis Journal, 5 Sept. 1871 [Ann. N. H.

(4) viii. p. 368], gives a short account of the *Insecta* found by him, *A. tellkampfi* being the only species identified.

Camel's Hump, Vermont: Sprague (Arch. Tr. Orl. Soc. i. pp. 85-88) gives a list of names of insects of all orders found here during a two days' expedition.

Chili: Taschenberg, in Z. ges. Naturw. xxxviii. pp. 38-42, briefly re-describes the Chilean *Creobius eydouxi*, Guér., = *Cascelius kingi*, Curt., *Bolbo-ceras* sp., *Areoda mutabilis*, Sol., *Buprestis* (*Halecia*?) sp., *Curis bella* and *Tibionema abdominalis*, Guér., *Dasytes trifasciatus*, Gory, *Mordella* sp., *Megalometis margaritaceus*, Er., *Lophotus eschscholtzi*, Schön., *Callidium submetallicum*, Blanch., *Calliophyrus macropus*, Newm., and *Cheloderus childreni*, Gray (all *Coleopt.*), and *Pompilus* (*Priocnemis*) *gravesi*, Curt., *Odynerus* sp., and a *Cryptus*, referring also to some larvæ from the same locality.

Malay Archipelago: prefixed to Smith's Catalogue of Indian Aculeate Hymenoptera, P. L. S. xi. p. 285 *et seq.*, is a brief introductory account by Wallace of his experience of the *Insecta* of this region.

Preservation of grain: Louvet (script. Louvel), C. R. lxxii. p. 120, describes his method of preserving grain *in vacuo* from the attacks of insects, &c. Charrière, Ann. Soc. Agric. Lyon (4), i. Proc. verb. p. clxxxv, for the same purpose, recommends the employment of carbonic acid.

Collecting: Bates (P. Geogr. S. xvi. p. 75 *et seq.*), in his "Hints to Travellers," gives some useful information.

Killing and preserving specimens: *cf.* Ent. v. pp. 228, 245, 263, 276, 319, on real or supposed effects of strychnia, camphor, &c. on specimens in museums.

Acari in collections are to be destroyed by application of heat (Loriferne), or by sulphate of carbon (Poujade), Pet. Nouv. p. 164.

Entomological nomenclature: on the question whether priority or general acceptance is to prevail, *cf.* Ent. M. M. viii. : Lewis, p. 1; McLachlan, p. 40; Kirby, pp. 41 & 142; Ulyett, p. 42; Crotch, p. 71; Briggs, p. 93. *Cf.* also Agassiz, Am. Nat. v. pp. 353-356; Lewis, Tr. E. Soc. 1871, p. 317; and Wallace's Presidential Address, Pr. E. Soc. 1871, p. lviii *et seq.*; also on the general subject of nomenclature of the *Insecta*, Harting (Arch. f. Nat. xxxvii. p. 24 *et seq.*), "Skizze eines rationellen Systems der zoologischen Nomenclatur;" and for his idea of the definition of a species, Fauvel, Mém. Soc. L. Norm. (2) iv. p. 229 *et seq.*, whose observations form a chapter of his "Faune Gallo-Rhénane," already published.

The entomological portion of Robinson's Essay towards a Natural History of Westmoreland &c. (1709), is reviewed by Birchall (Zool. s. s. vi. p. 2670). Gôdart's work (1682) is also commented upon by Roberts, *ibid.* p. 2787.

De Marseul (Nouv. et faits, p. xcix) indicates the publication of entomological papers in the 'Histoire et typographie du canton de Gêradmer' (1852, 8vo, pp. 176).

Villa: for a list of the publications of this entomologist, *cf.* S. E. Z. xxxii. pp. 97 & 233.

Thomson's 'Opuscula Entomologica:' Sharp (Ent. M. M. vii. p. 204) gives an analysis of fasc. i. & ii.; and fasc. iii. is similarly treated by the Recorder in Ent. Ann. 1872.

Errata: Dohrn (S. E. Z. xxxii. p. 47) jokes at the expense of Gaubil and the Bull. Mosc. on the subject of printers' errors.

COLEOPTERA.

By E. C. RYE.

ALLARD, E. Description de quelques Coléoptères nouveaux et Notes diverses. L'Ab. v. (1868), pp. 465-478.

This paper appears to have escaped observation in the present work: the various species described in it will be found below, in their due places.

BALLION, E. Eine Centurie neuer Käfer aus der Fauna des russischen Reiches. Bull. Mosc. xliii. pp. 320-353.

Diagnoses of species only; the full descriptions are to appear in a larger work on the Coleopterous Fauna of the Turkestan provinces. One new genus (*Melolonthidæ*) is characterized in it.

——. Catalogus Coleopterorum von Dr. Gemminger und B. von Harold. Bemerkungen und Berichtigungen zu demselben (Artikel II.). *Ibid.* xliv. pp. 148-170.

Further criticisms, reaching to the *Melasomata*.

BARGAGLI, P. Materiali per la Fauna Entomologica dell' Isola di Sardegna. Coleotteri. Bull. Ent. Ital. iii. pp. 47-54, 189-194, 352-359.

Continues the author's list of Sardinian *Coleoptera*, from *Cybister* to commencement of the *Nitidulidæ*.

BAUDI, FLAMINIO. Coleopterorum messis in insula Cypro et Asia Minore ab Eugenio Truqui congregatæ recensitio: de Europæis notis quibusdam additis (Pars quarta). B. E. Z. xv. pp. 49-71.

The author continues his remarks upon *Coleoptera* from the above specified localities (*Elateridæ*—*Melyridæ*). He describes some new species.

BOLD, THOMAS JOHN. A Catalogue of the Insects of Northumberland and Durham (Revision of Coleoptera). Newcastle-on-Tyne: 1871 [extr. from Tr. North. Dur. iv.].

Practically an original work, though it may be regarded as a 2nd edit. of Hardy & Bold's former Catalogue. For review, cf. Ent. M. M. vii. p. 236.

CROTCH, G. R. List of all the Coleoptera described A.D. 1758-1821, referred to their modern Genera. Cambridge: 1871, pp. 24.

This title, which otherwise explains the scope of the work, should have stated that it only applies to the *Cicindelidæ*, *Curabidæ*, and *Dytiscidæ*. The law of priority is strictly adhered to, all species being renamed by the author the names of which were inadmissible, as preoccupied or erroneously referred when first employed. These will be noticed in their proper places; but want of space will not allow the Recorder to reproduce other alterations in nomenclature adopted in this useful pamphlet.

CROTCH, G. R. Synopsis Coleopterorum Europæ et confinium anno 1868 descriptorum. London: 1871, pp. 68.

Consists of reproductions or abbreviations of diagnoses, with very brief differential characters, also rectifications of nomenclature &c. notified in the same year, and tabulated lists of species from monographs. For review, cf. Ent. M. M. vii. p. 236.

DESBROCHERS DES LOGES, J. Description de Coléoptères nouveaux d'Europe et confins et remarques diverses. Mitth. Schw. ent. Ges. iii. pp. 337-376.

Consists of:—I. "*Curculionides* nouveaux de genres divers," in reality comprising descriptions of one new genus and 36 new spp. of *Dytiscidæ*, *Histeridæ*, *Ptinidæ*, *Melolonthidæ*, *Cetoniadæ*, *Chrysomelidæ*, and *Eumolpidæ*, as well as of *Curculionidæ*; II. "*Brachycerus* nouveaux d'Europe et d'Algérie," 21 spp. and a supplement to I., 5 new spp. of *Elateridæ*; III. "Notes synonymiques et remarques diverses."

FÄHRÆUS, OL. IM. Coleoptera Caffrariæ, annis 1838-1845 a J. A. Wahlberg collecta (Heteromera). Öfv. Vet. Ak. xxvii. pp. 243-358.

This commencement of a continuation of Boheman's '*Insecta Caffrariæ*' contains descriptions of new genera and species of *Tenebrionidæ*, *Cistelidæ*, *Lagriidæ*, *Anthicidæ*, *Mordellidæ*, *Rhipido]phoridæ*, and *Meloidæ*.

——. *Ibid.* xxviii. *Curculionides*, i. pp. 3-69, 197-291; Fam. Brenthidæ, Anthribidæ et Bruchidæ, pp. 433-452; Fam. Scolytidæ, Paussidæ, Bostrichidæ et Cioidæ, pp. 661-672.

FAIRMAIRE, LÉON. Essai sur les Coléoptères de Barbarie (7). Ann. Soc. Ent. Fr. (4) x. pp. 369-404.

Continues the author's papers on the same subject (1858-1868).

——. Notes sur les Coléoptères recueillis par Charles Coquerel à Madagascar et sur les côtes d'Afrique (3). *L. c.* (5) i. pp. 29-78.

Continues the author's papers on the same subject, published *ibid.* 1868 and 1869. Many new species and some new genera are characterized.

GEMMINGER, MAX, & HAROLD, E. VON. Catalogus Coleopterorum hucusque descriptorum synonymicus et systematicus. viii. pts. i. & ii. 8vo. Munich: 1871.

Comprises the *Curculionidæ*. Harold (*C. H.* vii. pp. 113-118) gives corrections in and additions to vols. i., iv., and v., and (*ib.* viii. pp. 117-122) vols. iii. and iv. of this work, Gemminger (*l. c.* vii. pp. 118 & 119, viii. pp. 122 & 123) also similarly treating vols. vii. and viii. Cf. also Ballion (*suprà*); Schaufuss, Nunq. Ot. i. p. 159; Chaudoir, Bull. Mosc. xliii. pt. ii. pp. 113 & 114; Dohrn, S. E. Z. xxxii. p. 434; Reiche, Ann. Soc. Ent. Fr. (5) i. pp. 88-90. Such of these alterations &c. as appear worthy of extraction will be found in their proper places in this Record.

HOCHHUTH, JOHANN HEINRICH. Enumération der in dem Russischen Gouvernements Kiew und Vohlynien bisher aufgefundenen Käfer. Bull. Mosc. xlv. pp. 176-253.

Enumerates the *Geodephaga*, *Hydradephaga*, and *Philydrida*, with notes as to localities, varieties, &c. A few apparently new species are described in it [one, at least, *Amara chaudi*, though treated in the same way as the others, being certainly already described].

HORN, GEORGE H. Contributions to the Coleopterology of the United States. Tr. Am. Ent. Soc. (June), 1870, pp. 69-97.

Descriptions, &c. (including spp. nn.), from *Cicindela* to *Engis*, inclusively.

——. Descriptions of new Coleoptera of the United States, with notes on known species. *Ibid.* (Nov.) 1871, pp. 325-344.

Cicindela to *Triplax*, inclusively.

[The Recorder takes this opportunity of remarking that, with the exception of separate copies of this author's papers, dated from Feb. 1870 to Dec. 1871, and arriving almost at the time of going to press, none of the chief American works have come to his hands since 1869.]

KÜSTER, H. C. Die Käfer Europas nach der Natur beschrieben.

The Recorder has observed a reference to Hft. xxix. of this work (Hft. xxviii. appeared so long ago as 1855), of which, however, he has not seen a copy. He has also been informed that there is a probability of one part at least being published by Kraatz, if it have not already appeared.

LENTZ, —. Dritter Nachtrag zum neuen Verzeichniss der preussischen Käfer, Königsberg, 1857. Schr. Ges. Königsb. xi. pp. 134-145.

Additions and corrections referring to former notices by the author in vols. i. and vii. of the same publication. A few brief diagnostic characters are given, with localities &c.

MACLEAY, WILLIAM. Notes on a collection of Insects from Gayndah (Coleoptera). Tr. Ent. Soc. N. S. W. ii. pp. 79-158 (pt. 2, 1870), 159-205 (pt. 3, 1871).

Includes from the *Cicindelidæ* to the *Cetoniidæ*. Some new genera and many new species are characterized in it, often very insufficiently, and entirely in English.

These insects were taken by Masters at Gayndah, a town on the Burnett River, about 150 miles inland from Wide Bay, Queensland, Australia.

MARSEUL, S. A. DE. Répertoire des Coléoptères d'Europe décrits isolément depuis 1864. L'Ab. viii. pp. 1-164.

The title speaks for itself. The portion published in 1871 includes from *Cicindela* to *Myrmedonia*.

MASTERS, GEORGE. Catalogue of the described Coleoptera of Australia. Part I. Sydney, 1871, pp. 64.

Contains the names (with references to publications and localities) of the *Cicindelidæ*, *Carabidæ*, *Dytiscidæ*, *Gyrinidæ*, *Hydrophilidæ*, and *Staphylinidæ*. Apparently founded on Gemminger and von Harold's Catalogue.

PASCOE, FRANCIS P. Notes on Coleoptera, with descriptions of new genera and species.—Part I. Ann. N. H. (4) viii. pp. 345–361, pl. xiv.

Nine new genera and exotic species of the *Trogositidæ*, *Othnuidæ*, *Tenebrionidæ*, *Cistelidæ*, *Pedilidæ*, and *Anthribidæ* are here characterized and, for the greater part, figured.

ROTTENBERG, A. VON. Beiträge zur Coleopteren-Fauna von Sicilien. B. E. Z. xv. pp. 225–247, Taf. viii.

Completes the account referred to at p. 248 of Zool. Rec. vii., *Rhynchophora* to *Coccinellidæ* inclusive. Some new species are described.

SAHLBERG, JOHN. Entomologiska anteckningar från en resa i sydöstra Karelen sommaren 1866. Not. Fenn. xi. (new ser. 8 Häft.), pp. 327–384.

The author here treats of the *Coleoptera* observed by him in his expedition to the south-east of Carelia, enumerating (with a few particulars as to synonymy, localities, dates of capture, &c.) 557 species, of which some are new to the recorded fauna of the district, and 4 are treated as new to science (one being described by Thomson). At p. 379 *et seq.* is a list of the most common species; and there is a list of publications on Finland *Coleoptera* in a note to pp. 329 & 330.

——. Anteckningar till Lapplands Coleopter-fauna. L. c. pp. 385–440.

After a notice in chronological order of the various writers who have specially described the *Coleoptera* of Lapland, Finland, and the neighbouring countries, and a special comparative analysis of the Lapp beetle-fauna, as regards that of all Scandinavia, the author enumerates (with short observations, as in preceding notice) 274 spp. observed by him in Lapland, of which many are here for the first time recorded as indigenous, 13 being described as new (one by Thomson). He notices the great affinity between the fauna of Scotland and Lapland, observing that of 160 peculiarly Lapp spp. no less than 30 (nearly one fifth) occur, according to Stephens, in Gt. Britain. His anticipations of an increase in this proportion are amply justified, seeing that of the 274 Lapp spp. now recorded, nearly 160 (or three fifths) have also been observed in Great Britain.

SHARP, DAVID. Catalogue of British Coleoptera. London, 1871, pp. 37.

3193 spp. are enumerated. A few corrections and corroborations of spp. first introduced in this work as indigenous are made by the author in Ent. M. M. viii. pp. 83 & 84. For a review of the Catalogue, cf. Ent. Ann. 1872, pp. 34–40.

SOLSKY, S. Prémisses d'une faune entomologique de la vallée de Zaravschan, dans l'Asie centrale. Hor. Ent. Ross. viii. pp. 133–165.

One new genus and 8 spp. nn. are characterized.

WALKER, FRANCIS. List of Coleoptera collected by J. K. Lord, Esq., in Egypt, Arabia, and near the African shore of the 1871. [VOL. VIII.]

Red Sea, with characters of the undescribed species.
London, 1871, pp. 19.

After a curt notice of a few of the more characteristic forms, of others occurring both in England and Syria, and of the various theories of geographical distribution, the author gives a catalogue (with localities) of 173 spp. taken by Mr. Lord, followed by brief and insufficient English diagnoses of 2 new genera and 50 new species.

WOLLASTON, T. VERNON. On additions to the Atlantic Coleoptera. Tr. E. Soc. 1871, pp. 203-314.

In this paper, 33 spp. (whereof 16 are treated as new) are added to the combined fauna of the Madeiras, Salvages, and Canaries, the whole number, allowing for correction of error, being raised to 1480. Some changes in nomenclature are made and adopted; and reference is also made to the discussions by Murray and Wallace on geographical distribution, the author being inclined to consider that the theory of a former land of passage between at least the above-mentioned consecutive groups is more likely to account for their peculiar fauna than dissemination by atmospheric agencies. He suggests, however, other means of passage for many of the non-indigenous species.

Crotch (Nature, iv. p. 65) supports Wollaston's views.

Further characters are given for many of the author's spp., some of which are redescribed, and extensions of localities are recorded.

———. On the Coleoptera of St. Helena. Ann. N. H. (4) viii. pp. 396-413 (Dec. 1871).

The author adds 21 spp. to the 74 referred to in Zool. Rec. vi. p. 195. 10 of these have been evidently imported; 4 of the remainder are probably established in the island through indirect human agencies; and the other 7 are considered veritable 'autochthones.' These latter and 4 of the others are treated as new. Of the whole 59 truly indigenous spp., the *Rhynchophora* still assert their former enormous preponderance, and the *Hydradephaga* and *Eucerata* are still unrepresented.

A new systematic catalogue is given of all the recorded species.

Coleoptera in birds'-nests are recorded by E. A. Waterhouse, Ent. M. M. viii. p. 15.

The Scotch fir: Sharp (Scot. Nat. i. pp. 36-42) gives a list of spp. recorded as occurring in Gt. Britain in this tree, briefly referring to their earlier stages.

Flood-refuge: Bertoloni (Bull. Ent. Ital. iii. pp. 41-46) enumerates spp. taken during a flood of the Adige.

Bedel, Nouv. et faits, p. lxxxvi, and Ann. Soc. Ent. Fr. (5) i. Bull. p. xxxviii, gives a list of spp. (some rare) taken at Calvados under layers of cockchafers, piled by the wind on the seashore.

Great Britain: the Recorder (Ent. Ann. 1872, pp. 23-92) gives his usual summary of the spp. first recorded in this country during the preceding year, captures of rarities, &c.; and also, pp. 125-201, a list of all spp. recorded in all Ent. Annuals, from 1855 to 1872. Changes of nomenclature proposed by

Crotch in C. H. vi. are, as far as British spp. are concerned, abstracted at pp. 24 & 25; and the like changes in the same author's "List of all the Coleoptera &c." are enumerated at pp. 26-29. Other alterations adopted by Sharp in his 'Catalogue' are referred to at pp. 36-38.

Belgium: Sauvcur (Ann. Ent. Belg. xiv. pp. 74-83) gives a supplement to the Catalogue of Belgian spp., indicating the vols. of Ann. Ent. Belg. in which the additions are recorded. De Borre, l. c. c.-r. p. xiv, adds a few more spp. Putzeys (*ibid.* p. xx) refers to others of the *Geodephaga*, in comparing Snellen v. Vollenhoven's list of Dutch *Coleoptera* with the recorded Belgian spp. For other additions, &c., cf. *ibid.* pp. xxiv & xxv, xxxv, xl, xli, lvi *et seq.*, and lxii; Sauvcur, l. c. p. lxvii, and De Borre, l. c. p. lxix.

Some ordinary German spp. are mentioned by Jordan (Ent. M. M. vii. p. 174), from the Drachenfels.

Desert of Tih: Crotch, Nature, iv. p. 55, briefly refers to the spp. found by C. F. Tyrwhitt Drake.

Captures of rare or local species are recorded from Great Britain, in Ent. M. M. vii. by Hislop, p. 219, Gorham, p. 254; viii. by E. A. Waterhouse, p. 38, McNab, *ibid.*, Sharp, p. 74 (cf. p. 83 for localities of spp. new to Britain in Sharp's Catalogue), Champion, p. 84, Holyoak, p. 85: from Cabourg and St. Germain, by Ch. Brisout, Ann. Soc. Ent. Fr. (5) i. Bull. p. xxxii *et seq.*: from Fontainebleau, by Grouvelle, Bonnaire, and Berce (*ibid.* p. xxxvi *et seq.*, and Pet. Nouv. p. 135): from Sos (Lot et Garonne), by Bauduer (*ibid.* p. xxxix), with notices of food-plants, &c.: from Nantes, by Chevrolat, with descriptions of 2 new spp., *ibid.* p. xli, and Pet. Nouv. p. 130: from Ste.-Beaume, by Ancy, Pet. Nouv. p. 124: from the Pyrenees, by Oberthur, *ibid.* p. 131: from Rambouillet, by de Narcillac, *ibid.* p. 132: from the French Alps, by Abeille de Perrin (Nouv. et faits, p. lxvi) and Bellier de la Chavignerie (*ibid.* p. lxvii): from Calvados, by Ch. Brisout, *ibid.* p. lxxxv, by Bedel (*suprà*), and Fauvel, *ibid.* p. xcix: from Marais Vernier, by Mocquerys and Levoiturier (c.-r. Soc. Sc. Nat. Rouen, v. pp. 188 & 189): from Karst, by Schreiber, B. E. Z. xv. p. 224: from Syria, by Auzoux, Nouv. et faits, pp. lxxxi & ciii, and Ann. Soc. Ent. Fr. (5) i. Bull. p. 1: from Algeria, by Raffray, with indications of spp. nn., in Nouv. et faits, pp. lxix & lxxiii, and Pet. Nouv. p. 159: and from Massachusetts, by Dimmock, in Canad. Ent. iii. p. 15.

Schaufuss (Nunq. Ot. i. p. 192) criticizes v. Heyden's "Entomologische Reise in das südlichen Spanien," &c.: the latter author replies in C. H. viii. pp. 124-127.

Bethune (Canad. Ent. iii. pp. 27, 88, 114, 134, 155, 172, 186, 211, 227) continues his reproduction of the descriptions of spp. from Kirby's 'Fauna Boreali-Americana,' with synonymic and other notes (*Halipidæ* to *Buprestidæ*).

De Marseul (L'Ab. vii.) continues his extracts of descriptions of new spp. &c. from Verh. z.-b. Wien, xviii., xix.; S. E. Z. xxvii., xxviii.; Mitth. schw. ent. Ges. ii.

Dejean's Hist. Nat. Col. d'Europe: Deyrolle (Pet. Nouv. p. 116) notes that the original drawings for the figures of this work are now in the possession of Mr. Edwin Brown, of Burton-on-Trent (*Cicindelidæ* and *Carabidæ*), and Dr. Sharp, of Thornhill, Dumfries (*Hydradephaga*).

Sharp (Ent. M. M. vii. p. 181, note) suggests the word "hind-body"

instead of "abdomen," often used improperly in describing the upper surface of the posterior segments, especially in the *Brachelytra*.

Alcohol: Fuchs (B. E. Z. xv. p. 287) recommends, from experience, the use of a few drops of this, in preference to benzine, in the collecting-bottle, for destroying life.

Instances of different species copulating are recorded by E. A. Waterhouse (*Ceuthorhynchideus* and *Celiodes*), Ent. M. M. viii. p. 66; by Morley (*Crepidodera*), *ibid.* p. 135; by Dei, Bull. Ent. Ital. iii. p. 197 (*Coccinella*); and by Hochhuth, Bull. Mosc. xlv. p. 208, note (*Coccinella* and *Phytonomus*!).

CICINDELIDÆ.

Oxygonia: H. W. Bates (Tr. E. Soc. 1871, p. 378) briefly recharacterizes this genus, endorsing its location by Chaudoir near *Odontochila*.

Cicindela hybrida and *campestris*: Aronstein, Tijdschr. Ent. (2) vi. p. 150, supplements Heylaert's observations on alteration in colour of these spp. by artificial heat.

Cicindela sahlbergi, Fisch.: Hochhuth (Bull. Mosc. xlv. p. 180) gives some particulars of this insect, which he thinks a good species.

Collyris aptera, Lund, *nec* Ol., is named *lundi*: Crotch, List, &c., p. 2.

New species:—

Oxygonia albitenia and *cyanopis*, Bates, *l. c.* p. 377, New Granada.

Cicindela gormazi, Reed, Ent. M. M. viii. p. 76, S. Chili; *C. crespignii*, Bates, *l. c.* p. 379, N. Borneo; *C. thibetana*, Blanchard, C. R. lxxii. p. 811, note, Thibet (diagn. only); *C. turkestanica* and *julizæ*, Turkestan, *chaudoiri*, Kapal, Ballion, Bull. Mosc. xliii. p. 322; *C. aberrans*, p. 29, (? *Megalomma*) *frontalis*, Madagascar, *semipicta*, Nossi-Bé, p. 30, Fairmaire, Ann. Soc. Ent. Fr. (5) i.; *C. puritana*, Horn, Tr. Am. Ent. Soc. 1871, p. 325, New Hampshire, U. S. A.

Megalomma uniguttatum, *rugicolle*, and *marginatum*, Fairmaire, *l. c.* pp. 31-33, Madagascar.

Distysiddera mastersi, Macleay, Tr. Ent. Soc. N. S. W. ii. p. 80, Gayndah.

CARABIDÆ.

H. W. BATES, under the heading "Notes on *Carabidæ*, and descriptions of new species," has published many observations on insects of various subfamilies of this group, chiefly from 'Tropical America, in Ent. M. M. vii. & viii. during 1871. Notices of these will be found in their due order.

PICCIOLI, in his "Catalogo sinonimico e topografico dei Coleotteri della Toscana" (Bull. Ent. Ital. iii. pp. 284-297), issues, with Bargagli's help, a small further instalment relating to Tuscan *Carabidæ*.

[*H*] *Omophronides*.

HORN, Tr. Am. Ent. Soc. 1870, pp. 70-75, tabulates and describes the American spp. of [*H*] *Omophron*, stating that *nitens*, Chaud., = *nitidum*, Lec., and including, as new, *robustum*, Nova Scotia, *obliteratum*, Arizona, p. 73, *ovale*, California, p. 75.

Elaphrides.

Diachila americana, Mots., = *subpolaris*, Lec.; *Trachypachys californicus*, id., = *gibbsi*, Lec.: Horn, l. c. p. 70.

Carabides.

HORN, l. c. pp. 97-105, gives a "Descriptive Catalogue of the species of *Nebria* and *Pelophila* of the United States," in which he identifies *Nebria mæsta*, Lec., as a var. of *castanipes*, Kby. (= *sahlbergi*, Fisch.), nec Lec. (*eschscholtzi*, Mén.).

Pelophila borealis: J. Sahlberg (Not. Fenn. xi. p. 402) records a Lapland specimen half the usual size.

Nebria nitidula, F., nec Schr., is changed to *banksi*; *Carabus calatus*, F., nec Web., to *carmiolicus*: Crotch, List, &c. p. 3.

Nebria brevicollis: Purves (Ann. Ent. Belg. xiv. c.-r. p. ii) records the issue of a specimen of *Gordius aquaticus*, 5 centim. in length, from an example of this species.

Carabus: Pirazzoli (Bull. Ent. Ital. iii. pp. 261-281, 305-332) describes the Italian species of this genus.

Carabus auratus: von Volxem (Ann. Ent. Belg. xiv. c.-r. p. xxv) records an arrest of development in a specimen of this insect, in which the pronotum was formed of two lateral and almost trapezoidal pieces, united by a short central suture, banded fore and aft by deep furrows—a structure opposed to Audouin's views of the formation of that segment.

Carabus nitens and *auratus*, L.: Suffrian (S. E. Z. xxxii. pp. 193-201) enters into a very detailed critical analysis of the original descriptions of and subsequent references to these species.

Carabus auronitens, F., should be cited as *auratonitens*, Illig., K. Pr. 157, n. 21, according to Suffrian (l. c. p. 203), who reproduces the somewhat spasmodic notes of Nodier on his capturing it for the first time.

Carabus brabeus: Schaufuss (Nunq. Ot. i. p. 194) explains the apparently erroneous reference of this to *macrocephalus*, Dej., from which he also avers that *cantabricus*, Chev., is distinct; he describes a Portuguese var. of *C. rugosus*, F., under the name *brannani*.

Carabus gladiator, Mots., = *tædatus*, F., var. *baccivorus*, Fisch.; *hudsonicus*, id., ? = *mæander*, Lap.; *tatumi*, id., = *serratus*, Lap.: Horn, l. c. p. 70.

Carabus monilis: a var. from the Vogelsberg is named *taunicus* by v. Heyden, Ber. Off. Ver. xii. p. 45.

Calosoma: the nocturnally predatorial habits of certain spp. of this genus are mentioned by Holyoak, Ent. M. M. viii. p. 85. De la Chavignerie, Ann. Soc. Ent. Fr. (5) i. Bull. p. lxii, notes that *C. sericeum* and *indagator*, F., differ in habits both *inter se* and from *C. sycophanta* and *inquisitor*, and notices slight differences between Algerian and French specimens of *C. sericeum*.

Calosoma rapax, Friv., is a colour var. of *sycophanta*, L., of which numerous deformities are briefly mentioned: Suffrian, l. c. pp. 191-193.

Calosoma tepidum, Lec., Californian var. noted; *prominens*, Lec., ? = *peregrinator*, Guér.: Horn, l. c. pp. 69 & 70.

Nebria pedemontana, Vuillefroy, L'Ab. v. p. 289, Piedmont [omitted from Zool. Rec. v.]; *N. ingens*, p. 98, California, *virescens*, p. 100, Vancouver I., *viridis*, p. 101, Alaska, Horn, l. c.: spp. nr.

Pelophila ulkii, sp. n., *id. l. c.* p. 105, Hudson's Bay Territory (?*californica*, Mots., *sec. auct.*).

Carabus descensus, sp. n., Schaufuss, *l. c.* p. 195, Estrella.

Calosoma haydeni, sp. n., Horn, *l. c.* p. 69, S. Colorado.

Callisthenes kuschakewitschi, *manderstjernæ*, *ssewertzowi*, Ballion, Bull. Mosc. xliii. p. 323, Russia; *C. latipenne*, Horn, *l. c.* p. 70, S. California: spp. nn.

Cyclrides.

Scaphonotus unicolor, F., *nec* Hb., is named *hunteri*, Crotch, List &c. p. 4.

Cychnus cylindricollis, sp. n., Pini, Atti Soc. Ital. xiv. p. 224, pl. 4, cave, Adda, Italy.

Pamborides.

Tefflus hamiltoni, Bates, Ent. M. M. vii. p. 244, Angola; *T. juvenilis*, Gerst-äcker, Arch. f. Nat. xxxvii. p. 42, Zanzibar: spp. nn.

Odontacanthides.

Sphallax peryphoides, Bates, is the *Actenonyx bembidioides* of White, whose generic characters are meaningless and misleading. The insect possesses some attributes of the *Helluonides* and *Bembidiides*; but, unless considered an anomalous form of the present subfamily, must form the type of a distinct equivalent group, for which Bates suggests the name *Actenonygeinae*: Bates, Ent. M. M. viii. p. 30, note.

Anchonoderides.

BATES (*l. c.* viii. p. 29 *et seq.*) points out fresh characters for this subfamily in the squamosity &c. of the soles of the anterior tarsi in the ♂, and considers that the Australian *Eudalia*, Casteln., corroborates Schaum's opinion that it is closely allied to the *Od(ont)acanthides*. Another genus, described by himself, connects it with the *Anchomenides*, other links occurring with that group and the *Coptoderides*; and the author concludes that many subfamilies of the *Truncatipennes* are ramifications from the *Anchomenides*. He gives fresh characters for this subfamily and a synopsis of its genera, repudiating, however, its title, as *Lachnophorus* is the most typical genus, and *Anchonoderus* appears to be of doubtful stability (*cf.* p. 33). *Camptotoma*, Reiche, seems not to belong to the group: *Stigma[to]phorus*, Mots. = *Lachnophorus*; and *Eucærus*, Lec. (*cf.* p. 77), and *Eudalia*, Cast. (recharacterized, p. 32), are here first included in it. The facies, habits, and distribution of the different genera are discussed; and the following observations occur:—

Lachnophorus niger, Gory, ?=*lavicollis*, Reiche, for which fresh localities are given, and *Bembidium tenuicolle*, Dej., is a *Lachnophorus* (p. 57).

Chalybe, Castelnau [preoccupied, in *Lepidoptera*, by Duponchel, 1836: Ent. M. M. viii. 31, note by Fds.], is maintained as a good genus (p. 79).

Ega: Castelnau has mistaken an enlargement of the apex of 3rd joint of palpi in this genus for a 4th joint; and the emargination of the mentum is not toothed, as Lacordaire avers (p. 102).

The following new genera and species are described :—

Amphithasus, p. 32. Of the facies of typical *Anchomenus*. *Am. truncatus*, p. 23, Ega; ? also *Anchomenus elegans*, Dej.

Aporesthus, p. 103. Paraglossæ not adherent to upper angles of ligula. Resembles *Diploharpus* (*Anchom.*) in form of head and trophi, but allied to the *Odontacanthides* in form of mentum and truncated elytra. *A. anomalus*, *ibid.*, R. Janeiro.

Eudalia macleayi, p. 32, N. S. Wales.

Anchonoderus subtilis, p. 33, Guatemala; *scabricollis*, p. 34, R. Janeiro.

Lachnophorus latus, p. 54, R. Tapajos; *æneicollis*, p. 54, *foveatus*, p. 55, *tibialis* and *ochropus*, p. 56, *macrospilus* and *ornatus*, p. 58, Upper Amazons; *quadrinus*, p. 54, *quadrinotatus*, p. 55, R. Janeiro; *submaculatus* (??=*Anchonoderus id.*, Mots., *sec. auct.*), p. 56, Amazons; *pictipennis*, p. 57, Mexico.

Eucerus sulcatus, *striatus*, and *geminatus*, p. 78, *lebioides* and *pulchripennis*, p. 79, R. Tapajos; *sericeus*, p. 78, Ega; *hilaris*, p. 79, St. Paulo.

Chalybe basalis, p. 80, R. Tapajos; *leucopa*, *ibid.*, St. Paulo; *tumidula*, p. 81, Ega.

Ega nodicollis, Upp. Amazons, and *biloba*, R. Tapajos, p. 103.

Ctenodactylides.

Leptotrachelus cruciatus, Ega, and *bifasciatus*, Peru: Bates, *l. c.* vii. p. 232, spp. nn.

Galeritides.

Zuphium numidicum, Luc., is affirmed to be distinct from *chevrolati*, Brullé: Fairmaire, Ann. Soc. Ent. Fr. (4) x. p. 369.

Drypta mastersi, sp. n., Macleay, Tr. Ent. Soc. N. S. W. ii. p. 82, Gayndah.

Calophæna viridipennis, p. 221, Pebas; *foveata*, *ib.*, and *depressa*, p. 222, Ega; *glabrata*, p. 221, R. Ucayali: Bates, *l. c.* spp. nn.

Polystichus australis, sp. n., Macleay, *l. c.*, Gayndah.

Helluonides.

Gigadema thomsoni, Casteln., = *sulcatum*, Macl.: *id. l. c.* p. 83.

Helluomorpha glabrata, *janus*, and *oculea*, p. 223, *subrostrata* and *linearis*, p. 224, Amazons: Bates, *l. c.*, spp. nn.

Pleuracanthus ebeninus, sp. n., *id. l. c.* p. 224, Ega.

Gigadema politulum, sp. n., Macleay, *l. c.*, Gayndah.

Helluosoma mastersi, sp. n., *id. ibid.*, Gayndah.

Brachinides.

Brachinus dubius and *atripensis* [*sic*], Ballion, Bull. Mosc. xliii. p. 324, Russia, spp. nn.

Lebiides.

CHAUDOIR (*ibid.* pp. 111–255, xliv. pp. 1–87) monographs this subfamily, which, as recharacterized and restricted by him, and in opposition to the views of Lacordaire, he confines to the spp. contained in *Lebia* and *Lamprias* by Bonelli, rejecting from Lacordaire's 3rd div., of which *Lebia* is the type, all but *Rhopalostyla*, *Lebia*, and *Lia*, and also *Nemotarsus* and *Plo-*

chionus,—*Lebidia* and *Pentoplogenus*, Morawitz, being stated to have nothing to do with the group. Several spp. referred to *Lebia* and *Lia* by Gemminger and v. Harold are at pp. 113 & 114 attributed to other genera not included in the present arrangement (N.B. pp. 114–123 are accidentally misplaced).

The author gives the name “épilobe” to the piece (variable in size and form) which in the majority of the *Carabidæ* borders the inner side of the lateral lobes of the mentum, from which it is separated by a distinct suture; and on the presence or absence of this he divides the present group into *Lampriadæ* [script. *Lembridæ*], which have the lobes appendiculated, and *Lebiidæ* [script. *Lebridæ*], in which there are no epilobes. With vol. xliii. are given 3 excellent plates, containing tinted figures of the right elytron of 163 spp., the references to which will be found at pp. 85–87 of vol. xlv., at pp. 82–84 of which is a list of spp. still unknown to the author, who, however, expresses his opinions as to the probably true position of many of them.

The following observations occur:—*Glycia* and *Tenioptilon*, Mots., = *Rhopalostyla*, Chaud.; *G. virgata*, Mots., = *vittata*, Zoubk.; *Omalomorpha*, *Homalops*, Mots., are merged in *Lamprias*; *Labida chloriventris*, Mots., = *Lamprias numidicus*, Luc.; *Omalom. obscuricollis*, Mots., ? = *L. punctatus*, Gebl.; *L. chrysocephalus*, Mots., = *chlorocephalus*, E. II., var. [cf. Rye, Ent. M. M. iv.]; *Lebia nigricollis*, Géné, = *cruix-minor*, L., var. *communiminacula*, Dahl; *affinis*, Dej., *limbicollis*, Mots., *cupripennis*, Chaud., = *marginicollis*, Dej., var.; *parellina*, Boh., = *minorum*, Putz.; *maculicornis*, Lec., = *pumila*, Dej., var.; *cyanea*, Dej., *mæsta*, Lec., = *viridis*, Say, varr., another var. being indicated (p. 193) under the name *violaceipennis*; *pretiosa*, Boh., = *bifasciata*, Dej.; *axillaris*, Lec., nec Dej., = *analis*, Dej.; *bonellii*, Putz., = *anchora*, Chev.; *rugiceps* and *distinguenda*, Putz., are one species; *vitticollis*, Rehe., = *pallipes*, Gory, ex typ.; *lebasii*, Mann., = *niromaculata*, Gory; *apicalis* and *terminalis*, Putz., are identical; *circularis*, Putz., = *pusilla*, Brullé, var.; *varia*, Sahlb., = *contaminata*, Mann.; *conjugens*, Lec., is somewhat unreasonably regarded as *vittata*, F., with the head of a *scapularis* gummed on; *flavovittata*, Chev., = *vittata*, F., of which a var. is described under the name *connecta*; *Lia fasciata*, Stm., is adopted for (*Chelonodema*) *elegans*, Mann., nec Gory; *L. comma*, Putz., = *12-punctata*, Dej., var.; *Lebidema spissicornis*, Motsch., = *Lia testacea*, Dej.

The following new genera and species are characterized:—

(*Lampriadæ*.)

Camaroptera, p. 118. Mentum not toothed at bottom of situation. *C. (Lebia) clavicornis*, Murray.

Orthobasis, p. 120. Mentum not wider than epilobes, with lateral lobes narrowly triangular, and suture prolonged parallel to post. margin, traversing median basilar piece; 4th joint of tarsi strongly bilobed. *O. (Leb.) bicolor*, Dej.

Dictya, p. 123. Allied to *Lamprias*, differing in the form of its palpi, the

strong bilobation of the 4th joint of its tarsi, and the pectination of its tarsal hooks. *D. (Lebia) cribricollis*, Moraw.

Lionedy, p. 126. Allied to *Lamprias* and *Rhopalostyla*, but strongly and coarsely punctured, except on the abdomen. *L. (Homalops) mongolica*, Mots.

Loxopeza, p. 138. Distinguished from *Lamprias* by its slender and glabrous palpi, superficially glabrous tarsi and base of antennæ, non-articulated small and narrow tooth to the mentum, and obliquely truncate basal joints of ant. tarsi in its ♂. *L. (Lebia) grandis*, Hentz, *tricolor* and *atriventris*, Say, *rufosutura*, Mots., *chloroptera*, Chaud., *striata* and *obliquata*, Dej., and ? *atriceps*, Lec.; also *majuscula*, p. 141, Texas, *melanocephala* and *rufolimbata*, p. 143, Mexico, spp. nn.

Liopeza, p. 145. Differs from *Lamprias* in the non-articulated tooth of its mentum, which is wide and rounded, its remarkably long tarsi, of which the 4th joint is scarcely emarginate, &c. *L. (Leb.) thoracica*, Bol.

Nematopeza, p. 146. Allied to *Liopeza*, but of different facies, and with shorter tarsi, and narrow and more projecting tooth to the mentum. *N. erythrodera*, p. 147, Natal, *dregei*, p. 148, C. G. Hope, *bacon* and *decora*, p. 150, N. Bengal, spp. nn.; (*Lebia*) *melanura*, Dej., *nobilis*, Boh., *basalis*, Chaud.

Grammica, p. 151. Resembles *Lebia*: tooth of mentum not articulated, 4th joint of tarsi strongly bilobed. *G. pictipennis*, sp. n., p. 152, Paraguay or int. Brazil; (*Lebia*) *scutellata*, Putz.

(*Lebiidæ sens. strict.*)

Promecochila, p. 157. Labrum longer than wide. *P. (Leb.) capensis*, Chaud.

Metabola, p. 160. Affords a transition to *Lamprias*. *M. rufopyga*, sp. n., *ibid.*, Mexico.

Aphelogenia (xliv.) p. 25. Differs from true *Lebia* in having no tooth to sinuation of mentum. *A. (Leb.) myops*, Dej., *nigrofasciata* and *granaria*, Putz., *nigrolineata*, Rche., *furcata* and *guttula*, Lec., *vittata* and *bivittata*, F., and the following spp. nn.:—*A. disconotata*, p. 27, *gratiosa*, p. 35, New Granada; *frenata*, p. 27, Cayenne; *trapezicollis*, p. 27, *fenestrata*, p. 29, *pulla*, p. 32, *elegantula*, p. 33, *discopicta*, p. 36, *testudinea*, p. 39, Amazons; *quadriplagiata*, p. 28, Yucatan; *argutula*, p. 28, *amabilis*, p. 30, *subtilis*, p. 32, Colombia; *hilaris*, p. 33, Mexico; *latiuscula*, p. 36, Rio Janeiro; *platensis*, p. 42, *perspicillaris*, p. 43, Argentine Pampas.

Dianchomena, p. 45. Distinguished from *Aphelogenia* by its very convex vertex and strongly constricted neck. *D. (Leb.) abdominalis*, Chaud., *vittigera* and *scapularis*, Dej., and the following spp. nn.:—*D. securigera*, p. 46, Buenos Ayres; *ruficeps*, p. 48, *vicina*, p. 52, Colombia; *rugatifrons*, p. 50, *intermedia*, p. 55, Yucatan; *leptodera*, p. 51, *amænula*, p. 52, New Granada; *humeroquittata* and *anchorifera*, p. 54, Mexico.

Stephana, p. 55. Apparently chiefly recognizable by the 7 or 8 denticles to claw-joint and very slight prolongation of the middle of the base of prothorax. *S. (Leb.) princeps*, Chaud.

Scythropa [preocc. as *Scythropus*, Schön.], p. 56. Elytra flattish, slightly striated, thorax evidently produced at base. *S. goudoti*, sp. n., p. 57, New Granada.

Ectomomesa, p. 58. Elytra convex, sulcate. *E. (L.) cæca*, Gory.

Astata, p. 60 [long preoccupied in *Hymenoptera*]. Head and thorax rugose, elytra flat. *A. (L.) tetragramma* (type form of *immaculata*, Boh., *picipennis*, Mots., and ? *hypoxanta*, Gerst.), which is questioned as identical with *L. bisbinotata*, Murray; and *deplanata*, Gerst.

Cymatographa, p. 62. Elytra arched, head attenuated behind the eyes, which are not very prominent. *C. (L.) undulata*, Dej.

Pæcilostola, p. 64. Eyes hemispherical, head strongly and angularly excised behind them. *P. discophora*, p. 65, Cayenne, *nebulosa*, p. 67, Ega, spp. nn.; *P. (L.) pendula*, Putz.

Lebia gabonica, p. 163, Gaboon; *holomera* (? = *humeralis*, Dej., abnorm. sec. auct.), p. 165, S. Europe; *flavoguttata*, p. 170, *luteofasciata*, p. 207, *similima*, p. 215, *sticticeps*, p. 229, Brazil; *epiphæa*, p. 173, *quinquenotata*, p. 202, R. Janeiro; *violacea*, Montevideo, *rhyti[do]lerania*, Paraguay, p. 182; *pleurodera*, p. 183, *similis*, p. 238, *lætula*, p. 244, *xanthopleura*, p. 250, *cursor*, p. 253, Cayenne; *chalcoptera* [script. *chaleoptera*], p. 183, Peru (? = *cupripennis*, Boh., sec. auct.); *striatifrons*, p. 185, *resurgens*, p. 245, [*h*]omostigma, p. 250, Amazons; *flavipes*, p. 191, ? Para; *agnata*, p. 196, *interrupta*, p. 210, *subrugosa*, p. 227, *latifascia*, p. 237, *nigriceps*, p. 242, *biannulata*, p. 15, Mexico; *biplagiata*, p. 204, *soror*, p. 232, *irregularis* and *umbrata*, p. 233, *confusa*, p. 234, *fusciceps*, p. 239, *subinterrupta*, p. 240, *sulcipennis*, p. 249, *annuligera*, and *obsoleta*, p. 4, *xanthophæa* and *subfasciata*, p. 16, Ega; *appendiculata*, p. 212, Lousiana; *incommoda*, p. 213, Campêche; *cægra*, Bolivia; *striaticeps*, p. 216, *consularis*, p. 217, *picicollis*, p. 231, Minas; *minuta*, Bahia, p. 216; *senegalensis*, p. 219, Senegal; *nilotica*, p. 220, Egypt; *natalensis*, *ib.*, *fuscula*, p. 221, Natal; *gressoria*, p. 223, N. Hindostan; *japonica*, p. 225, Japan (? = *retrofasciata*, Mots., sec. auct.); *melanonota*, p. 226, Moreton Bay; *anchorago*, p. 235, *quadrinicta* and *asterisca*, p. 18, Petropolis; *dentata*, p. 236, *lacerata*, p. 237, *haplomera*, p. 7, *melanoptera*, p. 19, New Granada; *discernenda*, p. 238, *cognata*, p. 5, *contigua*, p. 6, Colombia; *yucatana*, p. 239, *incoherens*, p. 244, *scitula*, p. 246, Yucatan; *frigida*, p. 242, U. S. America; *planiuscula*, p. 243, *ascendens*, p. 13, Cantagallo; *luteocincta*, p. 251, *memoralis*, p. 10, *denticulata*, p. 12, New Friburg; *confusula*, p. 4, *longiloba*, p. 15, Cartagena; *guyanensis*, p. 17, Paramaribo.

Lia thomsoni, p. 69, *nigromarginata*, p. 74, Brazil; *albovariegata*, p. 70, *figurata*, p. 81, Ega; *decem-maculata*, p. 73, New Friburg; *boliviensis*, p. 75, Bolivia; *trifasciata*, p. 76, Venezuela.

Cymindis macularis, Mann.: Rosenhauer (S. E. Z. xxxii. p. 411) describes the habits of this species at Erlangen and in Hanover.

Dromius marginellus, F., nec Hb., is changed to *schneideri*; *Tetragonoderus biguttatus*, Thunb., nec F., to *thumbergi*: Crotch, List, &c., pp. 6 & 7.

Phlæocarabus, g. n., Macleay, Tr. Ent. Soc. N. S. W. ii. p. 85; associated with *Cymindis*. *P. mastersi*, sp. n., *id. ibid.* Gayndah.

Phlæodromius, g. n., *id. ibid.* *P. piceus*, sp. n., *id. l. c.* p. 86, Gayndah.

Eulebia, g. n., *id. l. c.* p. 86. *E. plagiata* and *picipennis*, *id. l. c.* p. 87, Gayndah, spp. nn.

Xanthophæa chaudiroi, sp. n., *id. l. c.* p. 84, Gayndah.

Cymindis crassiceps, *id. ibid.*, Gayndah; *C. translucida*, Ballion, Bull. Mosc. xliii. p. 324, Russia: spp. nn.

Homethes velutinus, p. 88, *marginipennis*, p. 89, Gayndah : Macleay, l. c., spp. nn.

Dromius humeralis, sp. n., *id. l. c.* p. 88, Gayndah.

Metabletus parallelus, sp. n., Ballion, l. c., Russia.

Lebia violacea, p. 324, *manderstjerneæ*, *dimidiata*, *quadrinaculata* [preocc. by Dejean and Villa], *albomaculata*, p. 325, Russia : *id. l. c.*, spp. nn.

Sarothrocrepis mastersi and *pallida*, p. 87, *fasciata*, p. 88, Gayndah : Macleay, l. c. spp. nn.

Pericalides.

"*Coptocephala*" *peregrina*, Godart, is a typographical error for *Coptodera*, *id.* : Lefèvre, Ann. Soc. Ent. Fr. (5) i. p. 98.

Eucalyptocola, g. n., Macleay, l. c. p. 91 : resembles *Thyreopterius*, but with true affinity to *Philophæus*. *E. mastersi*, sp. n., *id. ibid.*, Gayndah (and ? Clarence R.).

Philophæus maculatus & *brunnipennis*, p. 89, *dubius* & *vittatus*, p. 90, Gayndah, *id. l. c.*, spp. nn.

Agonochila suturalis, sp. n., *id. l. c.* p. 91, Gayndah.

Scopodes æneus, p. 91, *lævis*, *angulicollis*, *auratus*, p. 92, *sericeus*, p. 93, Gayndah : *id. l. c.*, spp. nn.

Pseudomorphides.

Pseudomorpha behrensi, sp. n., Horn, l. c. 1870, p. 76, California.

Silphomorpha polita, p. 93, *rufomarginata*, p. 94, Gayndah : Macleay, l. c., spp. nn.

Adelotopus mastersi and *subopacus*, p. 94, *analis* and *maculipennis*, p. 95, Gayndah : *id. l. c.*, spp. nn.

Ditomides.

Ditomus rubens, Fairmaire, Ann. Soc. Ent. Fr. (5) i. Bull. p. lxxii (diagn. only), Sardinia ; *D. chodshenticus*, Ballion, l. c. p. 326, Chodshent : spp. nn.

Apotomus mastersi, sp. n., Macleay, l. c. p. 95, Gayndah.

Anthiades.

Anthia maxillosa, F., nec *Manticora id.*, nec Fourcr., is named *fabricii* : Crotch, List, &c., p. 7.

Morionides.

Nomius pygmæus, Dej., has been taken in dept. of Haute-Garonne, according to Putzeys (Nouv. et faits, p. xcv), who states it agrees with a *Haplochile*, Lec. (Morio, Dej.), from the United States, and must therefore be cosmopolitan. Leconte's genus does not stand, and Dejean's species must be reestablished.

Morio longicollis, p. 95, *seticollis*, p. 96, Gayndah : Macleay, l. c., spp. nn.

Scaritides.

Scarites polyphemus, Bon., nec Hb., is named *cyclops* ; *S. politus*, Wied. nec Bon., is named *wiedemanni* : Crotch, l. c. p. 8.

Philoscaphus, g. n., Macleay, *l. c.* p. 96. *P. mastersi*, sp. n., *id. ibid.*, Gayndah, and *Carenum tuberculatum* and *carinatum*, Macl.

Carenum salebrosus, *occultum*, *viridimarginatum*, p. 97, *politulum*, *ovipenne*, *submetallicum*, *angustipenne*, p. 98, Gayndah : *id. l. c.*, spp. nn.

Scarites chaudioui, sp. n., Ballion, *l. c.* p. 326, Russia.

Dyschirius longicollis, sp. n., Fairmaire, Ann. Soc. Ent. Fr. (4) x. p. 371, Morocco.

Panagæides.

Panagæus crux-major. Weyers & von Volxem (Ann. Ent. Belg. xiv. c.-r. 68) refer to a var. of this sp., with perfectly rotundate sides to thorax.

Chlæniides.

Chlænius 4-sulcatus, Ill., *nec* Payk., is changed to *illigeri*; *C. agrorum*, Ol., = *variegatus*, Fourcr., *nec* Fab., to *olivieri*; *C. sulcatus*, F., *nec* Ol., to *paykulli*: Crotch, *l. c.* p. 9.

Horn, Tr. Am. Ent. Soc. 1870, p. 105 *et seq.*, gives a paper "On the species of *Oödes* and allied genera of the United States" (*Lachnocrepis*, *Anatrachis*, *Evolenes*).

Eurygnathus parallelus, Chaud., is not specifically separable from *E. latreillii*, and the locality quoted conveys a false impression: Wollaston, Tr. E. Soc. 1871, p. 215. Chaudoir (Pr. E. Soc. 1871, p. xxxvi) demurs to this opinion.

Chlænius gonospilus, Walker, List Col. Lord, p. 10, Hor Tamanib; *C. tenuelimbatus*, p. 326, *pallidicornis*, p. 317, Chodshent, Ballion, *l. c.*; *C. viduus*, p. 325, Missouri, *orbis*, p. 326, Texas, *alternatus*, p. 327, Saskatchewan region, Horn, *l. c.* 1871: spp. nn.

Licinides.

Licinus silphoides, F., *nec* Rossi, is changed to *fabricii*; *Rhembus impressus*, F., *nec* Pz., Ol., to *daldorfi*: Crotch, *l. c.*

Badister piceus, Ballion, *l. c.* p. 327, Chodshent; *B. anchomenoides*, Macleay, *l. c.* p. 120, Gayndah: spp. nn.

Physolæsthus grandipalpis, sp. n., *id. l. c.* p. 121, Gayndah.

Cnemacanthides.

Brosicus asiaticus and *limbatus*, Ballion, *l. c.*, Russia: spp. nn.

Promecoderus viridis, sp. n., Macleay, *l. c.* p. 99, Gayndah.

Stomides.

Meonis ovicollis, sp. n., *id. l. c.* p. 100, Gayndah.

Cratocerides.

Phorticosomus rugiceps, sp. n., *id. ibid.*, Gayndah.

Anisodactylides.

Orthogonius. CHAUDOIR (Ann. Ent. Belg. xiv. p. 95 *et seq.*) monographs this genus and its allies, which, on account of their

ligula not being free at the apex, their tarsi being squamulate beneath more or less in both sexes, and with almost always denticulated claws, &c. he associates with the *Truncatipennes*, though admitting that they afford a transition between that group and *Zabrus*.

The following observations occur:—*Apsectra*, Schm.-G., founded on its simple claws, is rejected, as an artificial division of *Orthogonius*, *A. duplicata*, Schm.-G., being named *schmidtgebeli*, as the *Carabus duplicatus* of Wiedemann almost certainly = *O. (Plochionus) alternans*; the author's own *Haplo-pisthius* is sunk as a subgenus; *Maraga*, Walker, has in all probability no relations with *Orthogonius*; *O. malabariensis*, Gory, *ex typ.*, = *hopei*, Gray; *brunnilabris*, MacL., = *acrogonus*, Wied.; *profundestriatus*, Schm.-G., probably = *puncticollis*, *id.*, var.; *rugiceps*, Murr., = *latus*, Hope; *strachani*, Hope, = *brevithorax*, Dej.; *dubius*, Hope, is one of the *Anisodactylides*; *picalabris*, MacL., = *femoratus*, Dej. The following new genera and species are characterized:—

Hexachatus, p. 124. Ligula much wider than in any other of the group, very truncated at apex, which is more free, the truncature having 6 setæ; paraglossæ geniculate; head coarsely and irregularly plicate; apex of elytra obliquely truncate, with the outer angle obtuse, and the sutural very sharp and subdentate. *H. (Orth.) lateralis*, Guér.

Actenoncus, p. 127. Facies rather different from *Orthogonius*, the elytra being convex; last joint of palpi subinflato-ovate; right mandible almost toothless inside. *A. (Actena) atrata*, Dej.

Anoncopeucus, p. 128. Unites *Orthogonius* to *Glyptus*; ligula 4-setose, mandibles edentate, maxillæ with vestige of obtuse hook at apex. *A. (Orth.) curvipes*, Dej.

Orthogonius picipennis, p. 100, Cambogia; *mniszehi*, p. 101, Malacca; *intermedius*, Java, *hypocrita*, Philippines and ? Java, p. 102; *hirtus*, p. 103, Poulo Pinang; *suturalis*, p. 104, P. Pinang and Malacca; *politus*, Malacca, *crassiscrus*, Java, p. 105; *insularis*, p. 106, P. Pinang; *mouhoti*, p. 107, Laos, Cochin China; *fugax*, p. 108, *parallelus*, p. 109, Ceylon; *baconii*, Bengal, and *longicornis*, Siam, *ibid.*; *punctulatus*, p. 110, E. India; *inops*, p. 111, Moluccas; *parvus*, Neelgheries, *schaumi*, Ceylon, p. 112; *crenaticrus*, Cambogia, *melanarius*, P. Pinang, p. 113; *angustus*, p. 114, Malasia, and ? N'gami; *mæstus*, p. 116, Senegambia; *pradierei*, p. 117, Gaboon; *piceus*, p. 122, Malacca; *luzonicus*, p. 123, Philippines.

Orthogonius doriæ, p. 104, note, Borneo, *cruralis*, p. 120, note, Sciotel (Bogos): Putzeys, *ibid.*, spp. nn.

Anisodactylus propinquus, sp. n., Ballion, *l. c.* p. 328, Tschemkent.

Lecanomerus ruficeps, p. 100, *aberrans*, p. 101, Macleay, *l. c.*, Gayndah, spp. nn.

Harpalides.

Dichirotrichus pubescens, Payk., *nec* Müll., is changed to *gustavi*; *Harpalus ferrugineus*, F., *nec* L., to *fabricii*: Crotch, *l. c.* p. 11.

Stenolophus exiguus and var. *luridus* recorded by Wollaston from Madeira: Tr. E. Soc. 1871, p. 217.

Cyclothorax, g. n., Macleay, *l. c.* p. 104. Position uncertain; dilatation of

the tibiae [sic] in ♂ scarcely noticeable. *C. punctipennis*, sp. n., *id. l. c.* p. 105, Gayndah.

Ophonus olcesii, sp. n., Fairmaire, Ann. Soc. Ent. Fr. (4) x. p. 369, Tan-giers.

Harpalus perezi, Vuillefroy, L'Ab. v. p. 294, Cartagena [omitted from Zool. Rec. v.]; *H. planipennis*, p. 101, *gayndahensis*, *angustatus*, *convexiusculus*, *ceneonitens*, p. 102, *atroviridis*, p. 103, Gayndah, Macleay, *l. c.*: spp. nn.

Stenolophus politus, sp. n., *id. ibid.*, Gayndah.

Acupalpus mastersi and *angulatus*, *id. l. c.* p. 104, Gayndah: spp. nn.

Trigonotomides.

Abaris, Dej. Bates (Ent. M. M. vii. p. 218) recharacterizes this genus, which he thinks should be placed close to *Drimostoma* and *Abacetus*.

Oxycrepis, Reiche. The diagnostic characters of this genus are recapitulated; and *O. leucocera*, Reiche, is stated to occur at Bahia: *id. l. c.* p. 148.

Abaris robusta and *picipes*, p. 219, *notiophiloides*, *striolata*, and *tachypoides*, p. 220, Amazons: *id. l. c.*, spp. nn.

Abacetus ater and *angustior*, Macleay, *l. c.* p. 105, Gayndah: spp. nn.

Amblytelus amplipennis and *minutus*, *id. l. c.* p. 106, Gayndah: spp. nn.

Tibarisus ater and *niger*, *id. l. c.* pp. 106 & 107, Gayndah: spp. nn.

Feroniides.

Loxandrus, Lec. Bates (*l. c.* p. 104) recharacterizes this genus, affirming its validity, and correcting Gemminger & v. Harold's reference of it to *Argutor*. To it he refers *Feronia postica* and *irina*, Brullé, *F. confusa*, Dej., and other spp. ascribed to *Feronia* and *Argutor*; and states that the genus is the only Amazonian representative of the group, giving also an account of their habits, &c.

Stolonis, Mots., is recharacterized, and stated to be closely allied to *Loxandrus*, and very closely to *Oxycrepis*: Bates, *l. c.* p. 148. *Anchomenus elegans*, Dej., *Anchonoderus id.*, Reiche, is to be referred to it (*sec. typ.*), and apparently also *Anchom. dimidiaticornis*, Dej., though the latter at first (*l. c.* p. 33) was attributed by Bates with some little doubt to *Oxycrepis*: *ibid.* p. 150.

Feronia (Pæcilus) puncticeps and *pauciseta*, Thoms. The Recorder (Ent. M. M. vii. p. 228) objects to Kraatz's proposed adoption of *cuprea*, L., for the former name, and *versicolor*, Stm., for the latter.

F. (P.) lepida and *koyi*. Hochhuth (Bull. Mosc. xlv. p. 207, note) records the capture of two specimens intermediate between these supposed species.

F. (Orthomus) occidentalis, des Cottes. Reiche, Mitth. schw. ent. Ges. iii. p. 427, proposes the name *modestus* for this sp., its present specific name being preoccupied.

F. (Argutor) assimilis. Hochhuth, *l. c.* p. 209, briefly describes under this name an insect from Kiew, dubiously referred to *diligens*, St., by him, as a var.

F. (Steropus) æthiops, Panz., *nec* Hb., is changed to *monticola*; *F. (Molops) terricola*, F., *nec* Hbst. (= *madida*, Payk., *nec* F.), to *geophila*: Crotch, *l. c.* p. 13.

F. (Haptoderus) nemoralis, Graells, and *cantabricus*, Schauf. Schaufuss (Nunq. Ot. i. p. 193) protests against v. Heyden's collocation of these.

Zabrus gibbus. Künstler (Verh. z.-b. Wien, xxi. Beih. p. 12) discusses injuries to cultivated plants from this species.

Amara, Bon. Putzeys (L'Ab. 1871, p. 100) monographs the 114 European spp. of this genus. According to him, *A. chaudiroidi*, Hochh., = *rufipes*, Dej.; *concinna*, Zimm., should be used instead of *lepida*, Zimm., which is ♀ of the same sp.; *ovalis*, Muls., seems scarcely different from *vulgaris*, Pz.; a new species, from Sardinia, is indicated, under the name *raymondi* (p. 25); *vulgaris*, Thoms., nec Pz., = *famelica*, Zimm.; *obscuricornis*, Mots., = *municipalis*, Dfts.; *indierensis*, Mots., = *ambulans*, Zimm.; *microcephala*, Mots., = *rupicola*, Zimm.; Schaum's reference of *zimmermanni*, Heer, to *bifrons*, Gyll., is by no means certainly correct; *rufocincta*, Sahlb., not uncommon in many parts of England, is stated not to occur in that country, and *brunnea*, Gyll., is adopted, from Ireland, as British, according to Dawson [whose insect has long been shown to be *rufocincta*]; *daurica*, Mots., = *torrida*, Ill.; *alpina*, F. [long recorded as British] is only recognized from Sweden and Lapland.

Amara chaudiroidi, Hochhuth, l. c. p. 211, redescribes and asserts the specific value of this insect.

Amara crenata and *fusca*, Dej. Habits described by Rosenhauer, S. E. Z. xxxii. pp. 412 & 413.

New genus and species :—

Metoncidus, Bates, l. c. p. 133. Allied to *Loxandrus* and *Abacetus*; dilated joints of ant. tarsi in ♂ not oblique, with 2 rows of close squamæ; elytra with series of large punctures on alternate interstices behind; mentum with central tooth much smaller than side-lobes, and broadly rounded at apex. *M. tenebrionides*, sp. n., id. l. c. p. 134, Ega.

Stolonis fulcostigma, p. 148, R. Janeiro; *leucotela*, p. 149, S. Brazil; *leistoides*, *lævicollis*, and *apicata*, p. 149, *gracilis* and *ovaticollis*, p. 150, Amazons: id. l. c.

Loxandrus sulcatus and *politissimus*, p. 105, *fulvicornis*, p. 106, *curtonotus*, p. 129, *rufostigma*, p. 130, *tetrastigma*, p. 131, Ega; *lævicollis*, p. 105, *calathoides*, p. 106, *vittatus*, p. 131, R. Janeiro; *xanthopus*, p. 106, *viridescens*, p. 132, Amazons; *subcordicollis*, p. 129, *subparallelus*, p. 130, *macroderus*, p. 132, St. Paulo; *gravescens* and *picticauda*, p. 130, *opaculus*, p. 132, *attenuatus*, p. 133, R. Tapajos; *rubescens*, p. 130, Upper Amazons; *4-notatus*, p. 131, Lower Amazons; *celebensis*, p. 133, Celebes: id. l. c.

Platyderus portalegræ and *saczi*, Vuillefroy, L'Ab. v. p. 293, Portugal [omitted from Zool. Rec. v.].

Feronia (*Chlænioideus*) *planipennis*, Macleay, l. c. p. 109, Gayndah.

F. (Pæcilus) subiridescens and *atronitens*, id. l. c. p. 110, Gayndah.

F. (Lagarus) distinguenda, Hochhuth, l. c. p. 207, Kiew.

F. (Orthomus) minutus, Reiche, l. c. p. 427, Greece.

F. (Notonomus) purpureipennis (♀ = *Fer. impressicollis*, Cast., sec. auct.), p. 107, *violaceomarginatus*, *cyaneocinctus*, *viridicinctus*, p. 108, *angustipennis*, p. 109: Macleay, l. c., Gayndah.

F. (Omaseus) mastersi, id. ibid., Gayndah.

F. (Argutor) foveipennis, p. 110, *nitidipennis* and *oodiformis*, p. 111, id. ibid., Gayndah; *F. (A.) boreella*, J. Sahlberg, Not. Fenn. xi. p. 403, Lapland; *F. (A.) planidorsis*, Fairmaire, Ann. Soc. Ent. Fr. (5) i. p. 420, Eastern Pyrenees.

F. (Steropus) sycophanta, Fairmaire, *l. c.* (4) x. p. 370, Morocco.

F. (Tapinopterus) martinezi, Vuillefroy, *l. c.* p. 290, Cuenca; *F. (Pterostichus) sousæ*, *id. l. c.* p. 291, Coimbra, and *paulini*, *id. l. c.* p. 292, Lisbon [omitted from Zool. Rec. v.].

Amara solieri, p. 31, note, Switzerland; *palæstina*, p. 47, Beyrout; *dichroa*, p. 62, Greece; *tingitana*, p. 63, Tangiers: Putzeys, L'Ab. 1871; *indivisa*, *id. Ann. Ent. Belg.* xiv. c.-r. p. viii, and S. E. Z. xxxii. p. 137, Diest (also dubiously referred to England by De Borre, *ibid.* p. xxiv, on Crotch's authority); *A. noctivaga*, Hochhuth, *l. c.* p. 213, Kiev.

Anchomenides.

Calathus piceus. Putzeys (Ann. Ent. Belg. xiv. c.-r. p. lxxviii), in referring to Belgian localities for this sp., notices the anticipation by Haliday (in 1841), under the name *Amphyginus*, of the generic separation lately proposed by des Cottes for it, under the name (*II*) *Omodactylus*.

Siagonyx, g. n., Macleay, *l. c.* p. 112. Differs from *Lestignathus*, Er., in its obtuse and apically corneous labium, short, broad, and almost entire labrum, and strong mandibles, which terminate in two very sharp arched teeth. *S. amplipennis* and *mastersi*, *id. l. c.* p. 113, Gayndah, spp. nn.

Sphodrus juvenescens, *substriatus*, and *occultus*, Ballion, Bull. Mosc. xliii. p. 328, Russia, spp. nn.

Pristonychus belonis, sp. n., Raffray, Soc. Clim. Alg. 1870, p. 221; *id.* Pet. Nouv. p. 160, Algeria (diagn. only).

Platynus nitidipennis, p. 111 (♀ rightly in the *Anchomenides*, *sec. auct.*), *planipennis* and *marginicollis*, p. 112, Gayndah: Macleay, *l. c.*, spp. nn.

Anchomenus turkestanicus, sp. n., Ballion, *l. c.*, Turkestan.

Pogonides.

CHAUDOIR (Ann. Ent. Belg. xiv. pp. 21-61) monographs this subfamily, which he divides into *Pogonidæ*, sens. strict. (*Cardioderus*, *Pogonus*, and 3 genn. nn.), and *Patrobidæ*—the latter again being split into *Patrobidæ*, sens. strict. (*Patrobus*, *Diplous*, and one g. n.), and *Deltomeridæ*, posterior constriction of head much further from eyes (*Penetretus* and *Deltomerus*).

He gives the following synonymy, &c:—*Pogonus apricans*, Mots., ? = *iridipennis*, Nic.; *caffer*, Boh., = *senegalensis*, Dej.; *hispanicus* and *viridanus*, Dej., *salsipotens*, Woll., = *chalceus*, Marsh., var.; *orientalis*, Gebl., *nec* Dej., already named *persicus* by Mann. & Chaud., is renamed *transfuga*; *sabinus*, Mots., *Amara interstitialis*, Fairm., = *meridionalis*, Dej.; *Patrobus napoleonis*, Reiche, = *excavatus*, Payk., ♀; *cinctus*, Mots., = *fossifrons*, Dej.; *angusticollis*, Mann., = *foveicollis*, Dej.; *fossifrons*, Fisch., Mann., *nec* Dej., is named *latiusculus*, of which *fulvus*, Mann., is an immature form; *rufipes*, Lec., *nec* Duft., is named *lecontii*: and describes the following new genera and species:—

Pogonistes, p. 32. Separated from *Pogonus*, from which it slightly differs in facies, on account of numerous small differences in the mentum. *P. (Pogonus) testaceus*, *rufocæneus*, and *gracilis*, Dej., *angustus*, Gebl. (*angustatus*, Mots.), *depressus*, Mots., and *convexicollis*, sp. n., p. 33, Odessa (? = *cordicollis*, Mots., *sec. auct.*).

Syrdenus, p. 34. Separated from *Pogonistes* by its exerted and porrect mandibles, different facies, &c. *S. (Pogonus) filiformis*, Dej., *grayi*, Woll., *fulvus*, Baudi (but see *suprà*), and *extensus*, sp. n., p. 35, Red Sea.

Diplochætus, p. 36. Ligula with two hairs, instead of one [!]. *D. (Pog.) rutilus*, Chevrr.

Ochtozetus, *ibid.* Intermediate between *Pogonides* and *Bembidiides*. *O. (Pog.) bicolor*, Brullé.

Platidius, p. 51. Of the flattened and parallel form of *Diplous*, Mots., but with shorter and stouter antennæ and palpi, the last joint of lab. palpi being subinflated. *P. (Patrobis) depressus*, Gebl., and *aterrimus*, Dej.

Pogonus cardiotracheus, p. 24, E. Australia; *parallelus*, p. 27, Egypt; *syriacus*, p. 29, Syria.

Patrobis styriacus, p. 41, Styria; *obtusiusculus*, p. 43, Hudson's Bay; *stygius*, p. 46, Newfoundland.

Deltomerus elegans, p. 54, Caucasus (Kazbek).

Patrobis picicornis, Zett. J. Sahlberg (Not. Fenn. xi. p. 332) indicates differences, possibly of specific value, between individuals of this species from Lake Ladoga and Lapland.

Pogonus fulvus, Baudi, ex typ., = *Cardioderus chloroticus*, Fisch.: Rottenberg, B. E. Z. xv. p. 247.

Trechides.

Trechus tetracoderus, Har. (*quadricollis*, Woll., nec Putz.) = *custos*, Woll.: Wollaston, Tr. E. Soc. 1871, p. 218. *T. palpalis*, Dej. (= *testaceus*, Duft., nec F.), is named *dejeani*: Crotch, List &c., p. 16.

Oopterus. Bates, l. c. viii. p. 14, remarks on the wide oceanic distribution of this apterous genus.

Trechus debilis, Wollaston, l. c. p. 217, Madeira; *T. atriceps*, p. 113, *ruflabris*, *concolor*, *ater*, p. 114, Gayndah, Macleay, l. c.: spp. nn.

Anophthalmus tenuis, p. 327, *eremita*, p. 328, Wyandotte Cave, S. Indiana: Horn, Tr. Am. Ent. Soc. 1871, spp. nn.

Oopterus maceyi, p. 13, Falkland I.; *lævicollis*, p. 14, N. Zealand: Bates, l. c., spp. nn.

Bembidiides.

Pericompsus, Lec. Bates, l. c. vii. p. 244, does not consider this genus so distinct from *Tachys* as Schaum has stated; he adds to it *Bemb. circuliforme*, Sol., withdraws from it *P. punctatellus*, Mots., and makes general observations upon its species.

Xystosomus, Schaum. Bates, l. c. p. 247, considers this much more distinct from *Tachys* than is *Pericompsus*, and adds to the characters of its spp.

Tachys dilatatus, Rott., = *algyricus*, Luc.: Rottenberg, B. E. Z. xv. p. 247. *T. monochrous*, Schaum., is omitted from Gemm. & v. Harold's Cat.; *Bemb. ornatus*, Apetz, is a *Tachys*; and further characters are given for *T. æneopiceus*, Bates: Bates, l. c. viii. p. 13.

Bembidium femoratum, Gyll., Sahlb., = *bruxellense*, Wesm.: J. Sahlberg, Not. Fenn. xi. p. 332. *B. concolor*, Brullé, nec Kirby, is named *fortunatum*: Wollaston, Tr. E. Soc. 1871, p. 219. *B. 4-guttatum*, F., nec Pont., is changed to *antiquorum*, and 4-pustulatum, Dej., nec F., = 4-guttatum, Ol., nec F., to *olivieri*: Crotch, l. c. p. 16.

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Scotodipnus. Baudi (Bull. Ent. Ital. iii. p. 25 *et seq.*) revises and describes the Italian spp. of this genus.

Liotachys, g. n., Bates, l. c. vii. p. 267. Facies of *Anthicus*; distinguished from *Pericompsus* and *Tachys* by its long and robust antennæ, which are dark, with 5 terminal joints white. *L. antennatus*, sp. n., *id.* l. c. p. 268, Santarem.

New species:—

Pericompsus grossepunctatus and *picticornis*, p. 245, *metallicus*, p. 246, Rio Janeiro; *simplex*, S. Brazil, *immaculatus* and *incisus*, Amazons, p. 246: *id.* l. c.

Xystosomus ovatulus, *strigosus*, and *gruti*, p. 248, R. Janeiro; *hilaris* and *sculpticollis*, p. 266, *elaphrinus*, p. 267, Amazons: *id.* l. c.

Tachys ceneopiceus, *platyderus*, and *fraterculus*, p. 268, *sulcipennis* and *dro-mioides*, p. 269, Amazons; *squiresi*, p. 269, R. Janeiro: *id.* l. c.; *diminutus*, Santarem, *cycloderus* and *subangulatus*, R. Janeiro, *monostictus*, R. Tapajos: *id.* l. c. viii. p. 11.

Tachyta parallela, Ega, *melania*, *xanthura*, and *crucigera*, R. Janeiro, p. 12; *livida*, p. 13, Adelaide: *id.* *ibid.*

Peryphus megaspilus, Walker, List Col. Lord, p. 10, Wâdy Gennèh.

Bembidium bistriatum [preoccup.], *striolatum*, *convexum*, p. 115, *bipustulatum*, *punctipenne*, *atriceps*, *transversicollis*, p. 116, *sexstriatum*, *ovatum*, *foveatum*, p. 117, *brunnipenne*, *rubicundum*, *subviride*, p. 118, *ampliipenne*, *gagatinum*, *flavipes* [preoccup.], p. 119, *bipartitum*, p. 120: Macleay, l. c., Gayndah. *B. serotinum*, Hochhuth, Bull. Mosc. xlv. p. 228, Kiew.

Scotodipnus subalpinus, p. 31, Val Sesia; *affinis*, p. 32, M. Lesima; *alpinus*, p. 33, Pinerolo; (*Microtyphlus*) *taurinensis*, p. 34, Turin: Baudi, l. c.

DYTISCIDÆ.

Hydroporides.

Hydroporus. Wehncke (B. E. Z. xv. p. 165) somewhat adds to the already more than sufficient confusion in the nomenclature of certain allied spp. of this genus, by publishing the following synonymy, stated to be founded on types received from Thomson & Kiesenwetter [cf. Zool. Rec. vi. p. 219, vii. p. 262, for former notices of synonymy]:—*H. nigrita*, Gyll., Thoms., = *pubescens*, Aubé, Schm.; *pubescens*, Gyll., Thoms., = *discretus*, Fairm., Schm., = *nigrita*, Stm., Redt.; *acutangulus*, Thoms., = *brevis*, Sahlb.; *brevis*, Thoms., = *nivalis*, Redt., = *nigrita*, F., Er., Aubé, Schm.; *glabriusculus*, Aubé, = *melanocephalus*, Marsh., Gyll., Thoms.; *melanocephalus*, Aubé, probably = *geniculatus*, Thoms., which the author hesitates to unite to *nigellus*, Mann. [in error, Marsh.]. He notices errors in Stein's catalogue, referring to this genus.

H. parallelus, Sharp, is renamed *longicornis*; *pubescens*, Gyll., = *melanocephalus*, Marsh. (*Dytiscus*, 1802) [but Marsham's name cannot in strictness be adopted, as there was a prior *D. melanocephalus* of Bergsträsser, in 1778]; and *melanocephalus*, Gyll., is renamed *scaphiformis* [already named *atriceps* by Crotch, cf. List & c. p. 20, and Zool. Rec. vii. p. 262]: Sharp, Ent. M. M. vii. p. 205.

H. ferrugineus, Luc. (nec Steph.), = *turgidus*, Er.: Wehncke, l. c. p. 206.

H. rufifrons, Dufts. (1805, *Dytiscus*), nec Müll. (1776, *id.*), nec F. (1792, *id.*), is renamed *duftschmidtii* by the Recorder, Ent. Ann. 1872, p. 47.

H. mixtus, *pulcher*, and *rufulus*, Mots., require renaming, on account of the prior spp. of Leconte & Aubé of those names: Ballion, Bull. Mosc. xliv. p. 152.

H. bicarinatus, Clairv. Des Loges, Mitth. schw. ent. Ges. iii. p. 337, describes a Corsican var. of this sp., under the name *obscurior*. He (p. 376) considers Fairmaire wrong in thinking his *H. mæstus* and *vestitus* distinct.

H. acutangulus, Thoms. J. Sahlberg (Not. Fenn. xi. p. 406) records a Lapland variety of this species, possibly entitled to specific rank.

H. hamatus, Gyll., occurs in Algeria: Leprieur, Ann. Soc. Ent. Fr. (5) i. Bull. p. xxxi.

Necterosoma, g. n., Macleay, l. c. p. 124. Allied to *Hydroporus*, but with long and stout anterior femora and tibiæ (the latter widely emarginated in the middle of the inner side in the ♂), and the 4 ant. tarsi 5-jointed. *N. vittipenne* and *flavicolle*, spp. nn., id. l. c. p. 125, Gayndah; (*Hydroporus*) *penicillatus*, *wollastoni*, *dispar*, &c., Clark.

Hyphydrus lugubris, sp. n., de Borre, Ann. Ent. Belg. xiv. c.-r. p. x, Sinai.

Hydroporus bonnairii, *avunculus*, and *nigricollis*, Fairmaire, Ann. Soc. Ent. Fr. (5) i. Bull. p. lxxii (diag. only), Corsica; *H. corsicus*, Corsica, *opacus*, Lapland, *pyreneus*, Pyrenees, Wehncke, l. c. p. 163; *H. bifasciatus*, p. 121, *foveiceps*, *brunnipennis*, *fossulipennis*, p. 122, *nebulosus*, *mastersi*, p. 123, *hurdus*, *basalis*, *politus*, p. 124, Macleay, l. c., Gayndah; *H. crotchii*, de Borre, l. c. p. xiii, Sinai; *H. borysthenticus*, Hochhuth, Bull. Mosc. xlv. p. 233, Dnieper; *H. mæstus* [preoccupied] and *semichusus*, p. 10, *lanceolatus*, p. 11, Wädý Ferran, Walker, List Col. Lord; *H. distinguendus* and *saucius*, p. 338, *nigricollis*, p. 339, Corsica, des Loges, l. c.: spp. nn.

Colymbetides.

Ilybius ænescens and *Agabus unguicularis*, Thoms., are recorded as German by Kraatz, B. E. Z. xv. pp. 166 & 167.

Agabus fuscipennis, Payk. J. Sahlberg (Not. Fenn. xi. p. 336) indicates differences, possibly of specific value, between Carelian and Lapland individuals.

Suphis lineatus, sp. n., Horn, Trans. Am. Ent. Soc. 1871, p. 329, Lower California.

Laccophilus quadrilineatus, sp. n., id. l. c. p. 330, Texas.

Colymbetes inæqualis, id. l. c. p. 330, N.E. California, Oregon; *C. simplex* and *includens*, Walker, l. c. p. 11, Arabia: spp. nn.

Scutopterus imbricatus, sp. n., Wollaston, Tr. E. Soc. 1871, p. 220, Madeira.

Ilybius badeni, Wehncke, B. E. Z. xv. p. 164, Hamburg, Altona; *I. ovatus*, Hochhuth, Bull. Mosc. xlv. p. 237, Kiew: spp. nn.

Agabus parallelepipennis, des Loges, Mitth. schw. ent. Ges. iii. p. 337, Corsica; *A. abnormicollis*, Ballion, Bull. Mosc. xliii. p. 329, Turkestan; *A. kessleri*, Hochhuth, *ibid.* xlv. p. 238, Kiew; *A. mastersi*, Macleay, l. c. p. 126, Gayndah: spp. nn.

Gawodytes (*Agabus*) *thomsoni*, p. 407, *angusticollis*, p. 408, *borcellus*, p. 409, Finland: J. Sahlberg, l. c., spp. nn.

Copelatus irregularis, p. 126, *elongatulus*, p. 127, Gayndah (the former also from Lizard Island): Macleay, l. c., spp. nn.

Dytiscides.

Cybister africanus, Lap., = *lateralis*, F., = *tripunctatus*, Ol.; *ovos*, Lap., = *binotatus*, Boh., = *bimaculatus*, Aubé, = *immarginatus*, F.: Gerstäcker, Arch. f. Nat. xxxvii. p. 43.

Cybister costalis, Ol., nec F., is changed to *olivieri*; *Hydaticus ruficollis*, F., nec Deg., to *banksi*; *fasciatus*, F., nec Deg., to *hunteri*: Crotch, List &c., pp. 22 & 23.

Trogus (Leach, 1817) cannot be used for *Cybister*, Curtis, as there is a prior *Trogus* in the *Ichneumonidae* (Panzer, 1806): Rye, Ent. Ann. 1872, p. 24.

Lowne (M. Micr. J. v. pp. 267-271, pl. lxxxix.), in a paper "On the so-called suckers of *Dytiscus*, and the pulvilli of Insects," maintains that the discs of the anterior tarsi in ♂ *Dytiscus* are merely remarkably developed pulvilli, their adhesive power not being attributable to atmospheric pressure. He gives highly magnified figures of their structure, compared with true pulvilli of other insects.

Eunectes helvolus, Klug, is redescribed, from Madeira, by Wollaston, l. c. p. 222.

Hydaticus fascicollis, Harris, and *zonatus*, Panz. Suffrian (S. E. Z. xxxii. p. 131) gives short characters for these, erroneously amalgamated in Melsheimer's catalogue.

Dytiscus (*Hydaticus*) *cinereus*. Suffrian (l. c. p. 132) refers to Schaum's statement of *H. zonatus* and *bilineatus*, and *Acilius sulcatus* ♀, being confused under this name in the Linnæan collection, in which no *cinereus* (as now known) exists, and considers the *Acilius* accidentally introduced. He notes erroneous descriptions of the thorax of *zonatus* by various authors, and suggests that the ♂ of *verrucifer*, Sahlb., has not been yet found or is confused with Finland or Siberian males of *zonatus* (cf. Kraatz, B. E. S. xv. p. 167).

Cybister gayndahensis, Macleay, l. c. p. 127, Gayndah; *C. auritus*, Gerstäcker, l. c., Zanzibar: spp. nn.

Eunectes punctipennis, sp. n., Macleay, l. c. p. 127, Gayndah.

GYRINIDÆ.

Gyrinus convexiusculus, sp. n., id. l. c. p. 128, Gayndah.

HYDROPHILIDÆ.

Hydrophilides.

Hydatotrepis, g. n., id. l. c. p. 129. Differs from *Hydrobius* in its 8-jointed antennæ, in not having the post. tarsi ciliated, and in its mesosternum being prolonged into a tubercle between the interm. femora. *H. mastersi*, sp. n., id. l. c. p. 130, Gayndah (and many other Australian spp., sec. auct.).

Hydrobaticus, g. n., id. l. c. p. 131. ? Distinct from *Philhydrus*, from which it differs solely in wanting a tubercle or carina on the mesosternum. *H. tristis* and *luridus*, spp. nn., id. ibid., Gayndah.

Hygotrophus, g. n., id. ibid. Differs from *Berosus* in its drooping head and the rounded base of its thorax. *H. nutans* and *involutus*, spp. nn., id. l. c. p. 132, Gayndah.

Hydrophilus gayndahensis, *id.* l. c. p. 129, Gayndah; *H. quadristriatus*, Horn, l. c. p. 331, New Jersey: spp. nn.

Sternolophus nitidulus, sp. n., Macleay, l. c., Gayndah.

Philhydrus elongatulus, *maculiceps*, and *marmoratus* (? a *Berosus*, *sec. auct.*), Gayndah: *id.* l. c. p. 130, spp. nn.

Chætarthria picea, sp. n., Hochhuth, Bull. Mosç. xliv. p. 246, Kiev.

Helophorides.

Helophorus grandis. Hochhuth, l. c. p. 248, apparently unacquainted with Thomson's works, notes a supposed sp. n. allied to but smaller than this insect.

H. griseus. Hardy (P. Berw. Nat. Club, 1871, p. 254) refers to a Cheviot var. of this sp. under the name *sphagnicola* (? = *planicollis*, Thoms., *sec. Bold, ibid.*).

Calobius is wrongly quoted as syn. of *Ochthebius* by Gemm. & v. Harold, and is really more allied to *Hydræna*: Wollaston, Tr. E. Soc. 1871, p. 223, note.

Helophorus elegans, sp. n., Ballion, Bull. Mosc. xliii. p. 329, Turkestan.

Hydrochus octocarinatus, Hochhuth, l. c. p. 249, Kiev; *H. parallelus*, Macleay, l. c. p. 133, Gayndah: spp. nn.

Ochthebius algicola, sp. n., Wollaston, l. c., Madeira.

Hydræna luridipennis, sp. n., Macleay, l. c., Gayndah.

Sphæridiides.

Cyclonotum (Sphær.) depressum, Klug, = *nitidum*, Boh., = *abdominale*, F.: Gerstäcker, Arch. f. Nat. xxxvii. p. 43.

Cyclonotum mastersi and *pygmaeum*, Gayndah: Macleay, l. c. p. 133, spp. nn.

PAUSSIDÆ.

Arthropterus westwoodi and *mastersi*, p. 153, *angusticornis*, *kingi*, and *elongatulus*, p. 154, Gayndah, *id.* l. c., spp. nn.

STAPHYLINIDÆ.

Fauvel (L'Ab. v. pp. 479-494) has published some synonymical remarks upon the *Brachelytra* of Gemminger and von Harold's Catalogue, which appear to have escaped the Recorder of Zool. Rec. v., and need not be reproduced after so long an interval.

Aleocharides.

Ocalea rivularis, Mill., = *castanea*, Er., var. *teste* Sharp: Rye, Ent. Ann. 1872, p. 38.

Aleochara villosa, Mann., recorded as British, with some reserve, by Bold (Cat. Ins. North. Durh. p. 114), who gives its characters in Ent. M. M. vii. p. 275.

Oxyptoda brachyptera, Ktz., *nec* Steph., is named *kraatzii*: Rye, l. c. p. 53. *O. spectabilis*, Märk., is to be used for *ruficornis*, Gyll., *nec* Grav. (*Aleochar.*): Sharp, Tr. E. Soc. 1871, p. 187 [v. Harold, C. H. vii. p. 124, considers that

Gyllenhal's name must be retained, as his insect does not clash with Gravenhorst's; but, apart from the inexpediency of retaining two spp. of the same name in the same family, the fact remains that, when Gyllenhal described his *Aleochara ruficornis*, there was another *Aleochara ruficornis* described by Gravenhorst, and not identical with his insect]. *O. riparia*, Fairm., nec Thoms., is named *mutata* (Harold, l. c., considers that Fairmaire's name should stand, as Thomson's insect = *exoleta*, Er.); *O. forticornis*, Fairm., is referred, with slight reserve, to *O. brachyptera*, Steph., which is redescribed: Sharp, l. c. p. 191.

Homalota: Scriba and Kraatz (B. E. Z. xv. pp. 149–161) record 14 spp. as German, of which 11 were described as new by Sharp in his revision of the British spp.: *H. subsericea*, Woll., probably = *sericea*, Muls.; *aleocharoides*, Woll., probably = *clivata*, Er.; *waterhousii*, Woll., is not, as Fauvel states, identical with *aneicollis*, Shp.: Wollaston, Tr. E. Soc. 1871, pp. 291 & 292. *H. macrocera*, Mots., nec Thoms., requires renaming: Ballion, Bull. Mosc. xliv. p. 153.

Atheta (*Homalota*) *coracina*, Sahlb.: J. Sahlberg (Not. Fenn. xi. p. 418) records this species as copulating in the snow in Lapland in May. He adds diagnostic characters for it, as compared with *A. latiuscula*, Thoms.

Phleopora corticina, Woll., = *reptans*, Grav.: Wollaston, l. c. p. 285.

Placusa infima, Er., and *Ohgota ruficornis*, Shp., occur at Madeira; *O. inflata* and *contempta*, Woll., = *parva*, Ktz.: id. l. c. pp. 292 & 295.

Gyrophana poweri, Crotch, = *puncticollis*, Thoms.: Sharp, Cat. Brit. Col. p. 10. Both were published in the same year (1867); and Crotch's sp. apparently should have priority: Rye, l. c. p. 53.

Myllena elongata, Kr., nec Matth., is named *kraatzii*: Sharp, l. c.

New genera and species :—

Diestota, Mulsant and Rey, Ann. Soc. L. Lyon, xviii. p. 168 (Op. Ent. xiv. p. 194). Resembles *Silusa*, but shorter, with intermediate coxæ not approximated, and the median plate of mesosternum short, scarcely prolonged to the half of the intermediate coxæ, and widely truncate at its apex. *D. mayeti*, id. l. c. p. 170 (Op. p. 196), Cette.

Myrmecocephalus, Macleay, l. c. p. 134. Apparently allied to *Tachyusa*. *M. cingulatus* and *bicingulus*, id. *ibid.*, Gayndah.

Falagria longipes, Wollaston, l. c. p. 284, Madeira.

Phytosus semilunaris, Muls. & Rey, l. c. p. 149 (Op. p. 173), Cette; *P. littoralis*, Horn, Tr. Am. Ent. Soc. 1871, p. 331, New Jersey.

Aleochara fuliginosa, M. & Rey, l. c. p. 163 (Op. p. 187), Calais [? = *kirbii*, Steph., *algarum*, Fauvel]; *A. mastersi*, Macleay, l. c. p. 136, Gayndah.

Apteranillus raffraii, Fairmaire, Ann. Soc. Ent. Fr. (4) x. p. 371, Boghari.

Myrmedonia australis, Macleay, l. c. p. 135, Gayndah; *M. drusilloides*, Solsky, Hor. Ent. Ross. viii. p. 153, Samarcand.

Calodera lapponica, J. Sahlberg, l. c. p. 416; *C. (Ityocara) laticollis*, Thomson, *ibid.* p. 345.

Tachyusa objecta, Muls. & Rey, l. c. p. 159 (Op. p. 183), Beaujolais; *T. coracina*, Macleay, l. c., Gayndah; *T. cavicollis*, Solsky, l. c. p. 154, Samarcand.

Oxyptoda pectita, p. 187, *edinensis*, p. 188, *verecunda*, p. 189, *tarda*, p. 192, Sharp. Tr. E. Soc. 1871, Gt. Britain; *O. analis*, Macleay, l. c., Gayndah.

Homalota flavicollis and *pallidipennis*, id. *ibid.*, Gayndah; *H. filum*, Muls. &

Rey, *l. c.* p. 81 (Op. p. 106), Provence; *H. sharpiana*, Wollaston, *l. c.* p. 288, Madeira; *H. (Atheta) nivicola*, Thomson, *l. c.* p. 419, Lapland.

Oligota subsericans, Muls. & Rey, *l. c.* p. 166 (Op. p. 190), Beaujolais.

Gyrophæna diversa, p. 129 (Op. p. 153), Lyons (? = *affinis*, var. *sec. auctt.*), *punctulata*, p. 132 (Op. p. 156), Gde. Chartreuse; *despecta*, p. 135 (Op. p. 159), Beaujolais; *brevicornis*, p. 139 (Op. p. 163), Lyons: *iid. l. c.*

Diglossa sinuaticollis, p. 152 (Op. p. 176), French coast of Channel; *crassa*, p. 156 (Op. p. 180), Hyères: *iid. l. c.*

Myllæna rubescens, p. 143 (Op. p. 167), Pyrenees, *valida*, p. 146 (Op. p. 170), Provence: *iid. l. c.*

Tachyporides.

Tachyporus tersus, Wat. Cat. (Ent. Ann. 1871, p. 32), *nec* Er., is named *pallidus*: Sharp, Cat. Brit. Col. p. 10.

Mycetoporus johnsoni, Woll.; var. *n. lubrica*, Madeira: Wollaston, *l. c.* p. 298.

Tachyporus centrimaculatus, J. Sahlberg, *l. c.* p. 420, Lapland; *T. tristis*, p. 136, *rubricollis*, p. 137, Gayndah, Macleay, *l. c.*: spp. nn.

Conurus rufipalpis, *atriceps*, *elongatulus*, Gayndah: *id. l. c.* p. 136, spp. nn.

Lordithon mæklint, sp. n., J. Sahlberg, *l. c.* p. 421, Lapland.

Boletobius pullus, sp. n., Solsky, Hor. Ent. Ross. viii. p. 156, Samarcand.

Quediides.

Heterothops minutus, Woll., = *dissimilis*, Grav., *nec prævius*, Er., as Fauvel erroneously states. Wollaston, *l. c.* p. 298.

Quedius fulgidus: Wollaston (*l. c.* p. 299) names respectively *robustus* and *depanperatus* two forms of this insect from the Canaries.

Quedius brevicornis, Thoms., is recorded from Gt. Britain by E. A. Waterhouse (Ent. M. M. viii. p. 14), who (*l. c.* p. 161) also records the capture of a small colony of another of the *fulgidus* group with red elytra, probably *puncticollis*, Thoms., in terms tending to corroborate its value as a species.

Heterothops melanocerus, sp. n., Solsky, *l. c.*, Samarcand.

Quedius speleus, sp. n., Horn, Tr. Am. Ent. Soc. 1871, p. 332 (& fig.), Wyandotte Cave, S. Indiana.

Staphylinides.

Ocypus fortunatarum: Wollaston, *l. c.* p. 302, so renames his *O. punctatissimus* (preoccupied by Dufour), of which he asserts the specific distinctness from *O. cupreus*.

Philonthus xantholoma, Gr.: Sharp (Ent. M. M. vii. p. 181) describes under the name *variolosus* a highly developed ♂ form of this sp. from Gt. Britain, in which the punctuation of the underside of the abdominal segments is more sparing and coarse than usual. To it he refers Berwick examples mentioned by Kraatz in Ins. Deutschl., and the fig. of *xantholoma* in Du Val's Gen.

Staphylinus luridipennis and *analis*, Gayndah: Macleay, *l. c.* p. 142, spp. nn.

Ocypus fuscoæneus, sp. n., Solsky, *l. c.* p. 158, Samarcand.

Philonthus australis, p. 139, *hæmorrhoidalis*, *pilipennis*, *politulus*, p. 140, *subcingulatus*, *chalybeipennis*, *xantholinoides*, p. 141, Gayndah: Macleay, *l. c.*, spp. nn.

Xantholinides.

Xantholinus morio, Wollaston, Ann. N. H. (4) viii. p. 410, St. Helena; *X. atriceps*, *piceus*, *cervinipennis*, p. 138, *cyaneipennis* and *dubius*, p. 139, Gayndah, Macleay, l. c.: spp. nn.

Leptacinus luridipennis and *cyaneipennis*, Gayndah, Macleay, l. c. p. 137: spp. nn.

Pæderides.

Lathrobium punctatum, Fourcroy (1785), being proposed for *brunnipes*, F. (1792), by Crotch, *L. punctatum*, Zett. (1828), Sahlb., is renamed *zetterstedti* by Rye, Ent. Ann. 1872, p. 25, note: *L. punctatissimum*, Scriba, = *scabricolle*, Er., according to Fauvel (Nouv. et faits, p. lxxxviii), who, however, makes this correction entirely on conjecture, by his own showing: *L. atripalpe*, Scriba, is recorded from Gt. Britain by Sharp, Ent. M. M. viii. p. 83.

Lithocharis diluta, Er., is recorded from Gt. Britain by Sharp, l. c., and *L. ripicola*, Ktz., from Madeira, by Wollaston (Tr. E. Soc. 1871, p. 307), who refers his own *L. fuscula* (nec Mann.) to *apicalis*, Ktz.

Lathrobium politulum and *piceum*, Gayndah, Macleay, l. c. p. 144, spp. nn. *Achenium nigriventre*, Fairmaire, Ann. Soc. Ent. Fr. (4) x. p. 372, Tangiers; *A. saintpierrii*, Allard, L'Ab. v. p. 465, Oran [omit. Zool. Rec. v.]: spp. nn.

Dolacoon pullus, Solsky, l. c. p. 161, Samarcand; *D. quadraticollis* and *elongatus*, p. 143, *nigripennis*, p. 144, Gayndah, Macleay, l. c.: spp. nn.

Cryptobium mastersi, p. 142, *apicale*, p. 143, Gayndah: *id.* l. c., spp. nn.

Stilicis ovicollis, sp. n., *id.* l. c. p. 145, Gayndah.

Scopæus rotundicollis, sp. n., *id.* *ibid.*, Gayndah.

Lithocharis tristis, *id.* l. c. p. 144, Gayndah; *L. gracilis*, Muls. & Rey, l. c. p. 83 (Op. p. 107), Lozère: spp. nn.

Stenus cylindricus, sp. n., Macleay, l. c. p. 145, Gayndah.

Pæderus albipilis, Solsky, l. c. p. 163, Samarcand; *P. cingulatus* and *angulicollis*, Macleay, l. c. p. 146, Gayndah: spp. nn.

Pinophilides.

Pinobius, g. n., *id.* l. c. p. 147. Doubtfully placed here, on account of its associations with the *Pæderides*. *P. mastersi*, sp. n., *id.* l. c. p. 148, Gayndah.

Pinophilus grandiceps and *mastersi*, p. 146, *brevis*, p. 147, Gayndah: *id.* l. c., spp. nn.

Edichirus pæderoides, sp. n., *id.* *ibid.*, Gayndah.

Stenides.

Stenus annulatus, Crotch: Rye, l. c. p. 57, points out the incorrect reference by Fauvel of this sp. to *aceris*, Lac.

Stenus fasciculatus, p. 341, Kexholm and Carelia; *bilineatus*, p. 412, and *ripicola* [sic], p. 414, Lapland, J. Sahlberg, Not. Fenn., xi.; *S. maculatus*, *gayndahensis*, *olivaceus*, p. 148, *similis*, *viridicæneus*, *cupreipennis*, *puncticollis*, p. 149, Macleay, l. c., Gayndah; *S. æreus*, Solsky, l. c. p. 163, Samarcand; *sulcatulus*, p. 84 (Op. p. 109), *cavifrons*, p. 86 (Op. p. 110), Beaujoulais, Muls. & Rey, l. c.: spp. nn.

Oxytelides.

Oxytelus fairmairii, Pand., and *Thinobius major*, Kr., are recorded as British by Sharp, Ent. M. M. viii. p. 83; *Oxytelus fulvipes*, Er., by Gorham, Pr. E. Soc. 1871, p. ii; and *Compsocbilus palpalis*, Er., by Wollaston, Ent. M. M. viii. p. 37.

Oxytelus depressus and allies: Rye translates and comments upon Czwalina's paper on this subject (Ent. M. M. viii. p. 37).

Oxytelus transversalis, Czwal., = *fairmairii*, Pand. (as the author conjectures); *tetraloma*, Czwal., = *simplex*, Pand., but must be retained, on account of the prior *simplex*, Mots.: Fauvel, Nouv. et faits, p. lxxxviii.

Trogophlaeus riparius, Lac., Er., Kr., = *bilineatus*, Steph., and *bilineatus*, Er., Kr., is renamed *erichsoni*: Sharp, l. c. vii. p. 182. *T. foveolatus*, Sahlb.: Champion, *ibid.*, gives locality for this rare British sp.

Deleaster dichrous, var. *adustus*, Bielz, = *Lesteva leachi*, Curt., and occurs in the north of Gt. Britain, the type form being apparently confined to the South: Rye, l. c. p. 15.

Sartallus, g. n., Sharp, l. c. vii. p. 217. Allied to *Bledius*, but of a broad, robust, and quite uncylindric build; 5th joint of tarsi very minute. *S. signatus*, sp. n., *id. ibid.*, S. Australia.

Megalops nodipennis, sp. n., Macleay, l. c. p. 150, Gayndah.

Bledius mandibularis, *id. ibid.*, Gayndah; *B. obscurus*, Muls. & Rey, l. c. p. 87 (Op. p. 111), Lyons: spp. nn.

Oxytelus alutaceifrons and *nitidifrons*, Wollaston, Ann. N. H. (4) viii. pp. 410 & 411, St. Helena; *O. brunneipennis* and *impressifrons*, Macleay, l. c., Gayndah: sp. nn.

Trogophlaeus despectus, sp. n., Muls. & Rey, l. c. p. 19 (Op. p. 113), Lyons.

Thinobius brevicollis, p. 90 (Op. p. 114), and *minor*, p. 92 (Op. p. 116), Lyons: *id. l. c.* spp. nn.

Homaliides.

Lesteva muscorum, Duv., and *Olophrum consimile*, Gyll., are recorded as British by Sharp, Ent. M. M. viii. pp. 73 & 83. J. Sahlberg, Not. Fenn. xi. p. 424, describes a Lapland var. of the latter, half the usual size, and occurring on snow.

Homalium concinnum, Msh., occurs in Madeira, doubtless imported: Wollaston, Tr. E. Soc. 1871, p. 312. (*H. Om. gyllenhalii*, Zett. nec Sahlb., = *Arpedium brachypterum*, Grav., var. Thoms., is considered a good sp., and named *brunnescens*, from Lapland: J. Sahlberg, l. c. p. 423.

Lesteva major, sp. n., Muls. & Rey, l. c. p. 93 (Op. p. 117), Mt. Pilat.

Eudectus whitii, sp. n., Sharp, l. c. p. 73, Scotland (? = *giraudi*, Redt., *teste* Shp.).

(*H. Omalium marinum*, Ragusa, Bull. Ent. Ital. iii. p. 196, Palermo; *H. gayndahense*, Macleay, l. c. p. 151, Gayndah; *H. lagopinum*, J. Sahlberg, l. c. p. 426, Lapland: spp. nn.

Anthobium granulipenne, sp. n., J. Sahlberg, l. c. p. 424, Lapland.

Phlæocharides.

Pseudopsis sulcatus is recorded from Canada: Horn, Tr. Am. Ent. Soc. 1871, p. 333.

Piestides.

Isomatus, Er., = *Eleusis*, Cast. : Horn, *l. c.* pp. 297-299, remarks on the spp. of the United States, pointing out variations exhibited by them from published descriptions.

Isomatus canadensis, Horn, *l. c.* p. 299, Ontario; *I. planicollis*, Macleay, *l. c.*, Gayndah : spp. nn.

Glyptoma brevicristatum, sp. n., Horn, *l. c.* p. 332, Arizona (figs. of head and thorax of it and *G. cristatum*).

PSELAPHIDÆ.

Trichonyx sulcicollis, Reich., is recorded from the north of England by Hutchinson : Ent. M. M. viii. p. 135.

Bryaxis waterhousii, Rye (*simplex*, Waterh.), is recorded from French coast by Ch. Brisout : Ann. Soc. Ent. Fr. (5) i. Bull. p. xxxiii.

Trimium brevipenne, Chaud. : Schaum's reference of this sp. to Britain is corroborated by Rye : Ent. M. M. vii. p. 207.

Tmesiphorus kingi, sp. n., Macleay, *l. c.* p. 151, Gayndah.

Ctenistes desbrochersi, sp. n. (diagn. only), Raffray, Pet. Nouv. p. 160, Algeria.

Tyrus mastersi, sp. n., Macleay, *l. c.* p. 152, Gayndah.

Pselaphus minyops, sp. n., Wollaston, Tr. E. Soc. 1871, p. 283, Madeira.

Bryaxis hirta and *atriceps*, Macleay, *l. c.* p. 152, Gayndah; *B. tuberventrif* and *oliveri* (diagn. only), Raffray, *l. c.*, Algeria : spp. nn.

Bythinus algericus, sp. n. (diagn. only), Raffray, *l. c.*, Algeria.

Claviger nebrodensis, sp. n., Ragusa, Bull. Ent. Ital. iii. p. 195, Sicily.

SCYDMENIDÆ.

Scydmaenus (Eumicrus) rufus, Müll. & K., is recorded as British by Rye, Ent. M. M. vii. p. 273; and *carinatus*, Muls., by Sharp, *ibid.* viii. p. 83.

S. (Napochus) claviger, Müll. & K. : J. Sahlberg (Not. Fenn. xi. p. 352) records an example of this species with a triarticulate club to the antennæ, the normal 8th & 9th joints being anchylosed.

Scydmaenus kingi, Macleay, *l. c.* p. 155, Gayndah; *S. pinguiculus*, Gerst-ücker, Arch. f. Nat. xxxvii. p. 43, Zanzibar : spp. nn.

Cephennium mycetæoides, sp. n., Wollaston, *l. c.* p. 281, Madeira.

SILPHIDÆ.

Silphides.

Silpha atrata : Künstler (Verh. z.-b. Wien, xxi. Beih. p. 49) discusses injuries to cultivated plants by this sp.

Adelops sarteensis, Bargagli : the author (Bull. Ent. Ital. iii. p. 39, pl. 1. figs. 1 & 4, nec fig. 2, as stated) supplements the description of this sp., which he figures.

Necrophorus chilensis, sp. n., Philippi, S. E. Z. xxxii. p. 293, Taf. 3. f. 7, Curicó, Chili.

Silpha fluctuosa, Schaufuss, Nunq. Ot. i. p. 204, Spain; *S. turkestanica*, Bal-lion, Bull. Mosc. xliii. p. 329, Turkestan : spp. nn.

Catops brunneipennis, J. Sahlberg, Not. Fenn. xi. p. 428, Lapland; *C. obscurus*, Macleay, l. c. p. 155, Gayndah: spp. nn.

Anisotomides.

Hydnobius perrisi, Fairm., is recorded from Durham by Bold: Ent. M. M. vii. p. 275.

Anisotoma grandis, Fairm., *oblonga* and *scita*, Er.: the characters of these spp. are discussed, and they are recorded as British, with some reserve, by the Recorder, *ibid.* p. 180, & viii. p. 159. *A. ciliaris*, Schm., is recorded from the French coast by C. H. Brisout: Ann. Soc. Ent. Fr. (5) i. Bull. p. xxxiii.

Agathidium clypeatum, Sharp, = *confusum*, Bris.: Sharp, Cat. Brit. Col. p. 16.

CORYLOPHIDÆ.

Orthoperus atomarius, Heer, is recorded as British by Sharp: Ent. M. M. viii. p. 83. *O. kluki*, Wank., is redescribed from German specimens by Habelmann & Kraatz: B. E. Z. xv. p. 141.

TRICHOPTERYGIDÆ.

Acrotrichis montandoni, Woll., nec Allib., = *nigricornis*, Mots.; and *A. obscena*, Woll. (*guerini*, Woll., *olim.* nec All.) is redescribed: Wollaston, Tr. E. Soc. 1871, pp. 231 & 232.

Ptinella aptera, Woll., nec Guér., *ratisbonensis*, Woll., nec Gillm., *proteus*, Matth., Woll., = *testacea*, Heer: *id.* l. c. p. 235.

Ptilium minutissimum, Gyll.: J. Sahlberg, l. c. p. 429, records a Lapland var.

Ptenidium atomaroides, Mots., and *Trichopteryx rivularis*, All., are recorded as British by Matthews: Ent. M. M. viii. p. 152. *P. lævigatum*, Woll., nec Gillm., = *brucki*, Matthews, MS.; *P. apicale*, Woll., nec Gillm., = *atomaroides*, Mots.: Wollaston, l. c. p. 234.

Trichopteryx fuscula, *longula*, *edithia*, p. 152, *cantiana*, p. 153, England: Matthews, l. c., spp. nn. (diag. only).

Ptilium caledonicum, sp. n., Sharp, l. c. p. 73, Scotland.

Ptenidium kraatzi, sp. n., Matthews, l. c. p. 152, Scotland (diag. only).

SCAPHIDIIDÆ.

Scaphidium punctipenne and *mastersi*, Gayndah: Macleay, l. c. p. 156, spp. nn.

Scaphisoma politum and *punctipenne*, Gayndah: *id.* *ibid.* spp. nn.

HISTERIDÆ.

HORN (Tr. Am. Ent. Soc. 1870, p. 134 *et seq.*, pl. 1) publishes descriptions of new spp. from U. S. America, redescribing *Saprinus estriatus*, Lec., fig. 12, and figuring *Margarinotus guttifer*, Horn, f. 5, *Heterius morsus*, Lec., f. 6, *H. brunneipennis*, Rand., f. 8, *H. settiger*, Lec., f. 9.

Platysoma depressum, F., = *compressum*, Hbst.; and Leconte's *depressum* need not be altered: Harold, C. H. viii. p. 117.

Hister succicola, Thoms.: Kraatz (B. E. Z. xv. p. 192) refers to the characters of this sp., suggesting to de Marseul the adoption of the older name *impressus*, F., for *cadaverinus*, Ent. H. *H. caffer*, Boh., = *nigrita*, Er.: Gerstäcker, Arch. f. Nat. xxxvii. p. 44.

Pelorus glaucopterus and a *Phylloscelis*, possibly referable to *testudo*, Gerst., both of excessive rarity, are recorded from Abyssinia by de Marseul, Ann. Soc. Ent. Fr. (5) i. Bull. p. lxvi.

Hololepta mastersi, sp. n., Macleay, l. c. p. 157, Gayndah.

Platysoma subdepressum, *convexiusculum*, *planiceps*, Gayndah: *id. ibid.*, spp. nn.

Hister marseuli, p. 339, *berardi*, p. 340, *compressus*, p. 341, des Loges, Mitth. schw. ent. Ges. iii., Algeria; *H. ulkii*, Nebraska, pl. 1. f. 3, *arizonæ*, Arizona, f. 2, p. 134, *gloveri*, Fort Cobb, f. 1, *militaris*, California, f. 4, p. 135, Horn, l. c.: spp. nn.

Epicrus beccarii, sp. n., Marseul, l. c. i. p. 81, Sarawak.

Heterius californicus, sp. n., Horn, l. c. p. 137, pl. 1. f. 7, Sonoma, California.

Tribalus doriae, p. 80, *bomba*, p. 82, Marseul, l. c., Sarawak; *T. californicus*, Horn, l. c. p. 137, pl. 1. f. 11, San Francisco: spp. nn.

Saprinus æqualis and *rubripes*, Walker, List Col. Lord, p. 11, Arabia; *S. biplagiatus*, Ballion, Bull. Mosc. xliii. p. 330, Russia in Asia; *S. gayndahensis* and *mastersi*, Macleay, l. c. p. 158, Gayndah; *S. æquipunctatus*, 1870, p. 140, *cænipunctatus*, 1871, p. 333, Horn, l. c., San Francisco: spp. nn.

Plegaderus nitidus and *fraternus*, Horn, l. c. 1870, p. 141, Nevada: spp. nn.

Onthophilus lecontei, sp. n., *id. l. c.* p. 138, pl. 1. f. 10, California.

Abræus australis, sp. n., Macleay, l. c. p. 159, Gayndah.

PHALACRIDÆ.

Phalacrus brunnipes, Bris., is recorded as British by Sharp: Ent. M. M. viii. p. 83.

Phalacrus æthiops, sp. n., Gerstäcker, Arch. f. Nat. xxxvii. p. 44, Zanzibar.

NITIDULIDÆ.

Meligethes: Reitter (Verh. Ver. Brünn, ix. Sonderabdr. pp. 135, 6 pls.) revises the European spp., 99 in number, of which 23 are described as new. He separates the genus into 3 subgenera,—1, *Meligethes*; 2, *Odontogethes* (*M. hebes* only); 3, *Acanthogethes* (type *M. solidus*). The plates, which are very rough and inartistic lithographs of outlines of the bodies of some spp., will be found useful, on account of their also giving the armature of the anterior tibiæ.

The following synonymical and other observations occur:—*M. rubripes*, Muls., = *fulvipes*, Bris.; *decoloratus*, Först., = *pumilus*, Er., var.; a var. of *cæneus* is described under the name *californicus*, p. 33, note; a var. of *viridescens* is named *germanicus*, and *olivaceus*, Gyll., is dubiously referred to the same sp. as a var.; *ventralis*, Baudi, = *corvinus*, Er.; *substrigosus*, Er., = *subrugosus*, Gyll., var.; *exaratus* and *quadridens*, Först., = *serripes*, Gyll.; *marrubii*, Bris., = *namus*, Er.; *palmatus*, Er., = *obscurus*, Er., ♂; 3 vars. of *maurus*, Stm.,

are described under the names *calvus*, p. 63, *meridianus* (T. iii. f. 39, d), and *durnus* (ib. e), the two latter with queries; *punctatus*, Bris., = *fuliginosus*, Er. *natricis*, Bris., = *opacus*, Rosenh.; *funebis*, Först., = *picipes*, Stm.; *nigerrimus*, Rosenh., = *mæstus*, Er.; 4-*striatus*, Först., = *ochropus*, Stm., ♂; *kunzii*, Er., = *difficilis*, Heer, var.; *melanarius*, Först., = *viduatus*, Stm.; *tenebrosus*, Först., = *pedicularius*, Gyll., ♂; *minutus*, Bris., = *distinctus*, Stm.; *subtilis* and *hypocrita*, Bris., = *lepidii*, Mill.; *crotchii*, Bris. [published in 1871] = *elongatus*, Rosenh.; *glauzii*, Kol., = *discoideus*, Er.; *castaneus*, Bris., *picipennis*, Muls., = *immundus*, Ktz.; *seniculus*, Er., = *murinus*, Er., ♀, of which *planiusculus*, Heer, is a var.; *ebenus*, Först., = *lugubris*, Stm.; *cristatus*, Först., = *gagathinus*, Er.; *menthae*, Bris., = *egenus*, Er.; *nigrita*, Luc., = *exilis*, Stm.; *olivaceus*, Heer (nec Gyll.) = *hebes*, Er.; *mutabilis*, Rosenh., = *brevis*, Stm., var.; *lamii*, Rosenh., = *fuscus*, Ol., var.

M. tristis, Woll., nec Sturm, = *seniculus*, Er., Wollaston, l. c. p. 236; *varicollis*, Woll., is redescribed, id. l. c. p. 237.

M. æneus: Künstler (Verh. z.-b. Wien, xxi. Beih. p. 46) discusses injuries to cultivated plants by this sp.

Epuræa rubiginosa, Heer: Wollaston (Tr. E. Soc. 1871, p. 254) demurs to Tournier's identification of *Symbiotes pygmaeus*, Hampé, with this insect [Zool. Rec. vi. p. 237], considering that some accidental transposition of types must have occurred.

New species:—

Brachypephus murrayi, Macleay, l. c. p. 159, Gayndah.

Carpophilus convexusculus, p. 159, *lividipennis*, *pilipennis*, *obscurus*, p. 160, *aterrimus*, p. 161, id. l. c., Gayndah.

Nitidula concolor, id. l. c. p. 162, Gayndah.

Soronia variegata, id. l. c. p. 161, Gayndah.

Æthina combusta, Gerstäcker, Arch. f. Nat. xxxvii. p. 44, Zanzibar.

Pria rubicunda, Macleay, l. c., Ganydah.

Meligethes fæsteri, p. 19, T. i. f. 3, a, b, c, Germany and Croatia; *foveifrons*, p. 20, ib. f. 4, a, b, c, Naumburg; *humerosus*, p. 25, ib. f. 5, a, b, c, Germany, Carinthia; *subrubicundus*, p. 28, ib. f. 8, a, b, c, Germany and Switzerland; *szwalinai* [sic], p. 36, ib. f. 15, a, b, c, N. Italy; *moraviacus*, p. 41, T. ii. f. 19, a, b, c, d, Moravia and Austria; *alpigradus*, p. 47, ib. f. 22, a, b, c, Central Pyrenees; *rosenhaueri*, p. 49, ib. f. 24, a, b, c, Austria, Crimea; *lederi*, p. 50, ib. f. 25, a, b, c, Oran; *hispanicus*, p. 51, ib. f. 27, a, b, c, S. de Cordova; *spinipes*, p. 52, ib. f. 28, a, b, c, d, ♂, 29, a, b, c, d, ♀, Andalusia, Cyprus; *dalmatinus*, p. 55, T. iii. f. 32, a, b, c, Dalmatia; *hoffmanni*, p. 57, ib. f. 34, a, b, c, Austria; *parallelus*, ib. f. 35, a, b, c, Albuera; *melancholicus*, p. 68, ib. f. 43, a, b, c, Pyrenees; *kirschi*, p. 80, T. iv. f. 53, a, b, c, Dresden; *diecki*, p. 81, ib. f. 54, a, b, c, Aix, Jura, Trieste, Silesia; *austriacus*, p. 89, ib. f. 60, a, b, c, Austria (? = *niger*, Bris. nec Newm., sec. auct.); *tropicus*, p. 94, T. v. f. 64, a, b, c, France, Algiers; *chalybæus*, p. 96, ib. f. 66, a, b, c, Vienna; *kraatzii*, p. 100, ib. f. 68, a, b, c, Greece; *brisouti*, p. 103, ib. f. 73, a, b, c, Seville; *bruckii*, p. 114, T. vi. f. 81, a, b, c, Trieste, Tuscany, Dalmatia: Reitter, l. c.: *M. rylli*, Wollaston, l. c. p. 238, Canaries; *M. heteropus*, sp. n., Gerstäcker, l. c. p. 44, Zanzibar; *M. pictus*, Rye, Ent. M. M. viii. p. 75 (figured in Ent. Ann. 1872, frontisp. f. 7, 7a), N.E. coast of England [= *mutabilis*, Rosenh., sec. Brisout, which is itself *brevis*, Stm., var., sec. Reitter].

Lordites claudus, sp. n., Gerstäcker, Arch. f. Nat. xxxvii. p. 45, Zanzibar.
Pocadius pilistriatus, Macleay, l. c. p. 162, Gayndah.
Cychramus niger, id. l. c. p. 163, Gayndah.
Ips politus, id. *ibid.*, Gayndah.

TROGOSITIDÆ.

Elestora: Pascoe, Ann. N. II. (4) viii. p. 345, recharacterizes this genus, redescribing and figuring (pl. xiv. f. 1) his *fulgurata* from Penang.

Leperina fasciculata, Redt., = *turbata*, Pasc.; and the Australian *Leperina* are doubtfully to be regarded as *Gymnochilides* according to Lacordaire's characters: id. l. c. p. 346.

Peltes oblonga occurs at Fontainebleau in galleries made by larvæ of *Cerambyx heros*: Grouvelle & Bonnaire, Ann. Soc. Ent. Fr. (5) i. Bull. p. xxxvii.

Melambia subcyanea, sp. n., Gerstäcker, Arch. f. Nat. xxxvii. p. 349, Aruscha.

Trogosita turkestanica, sp. n., Ballion, Bull. Mosc. xliii. p. 330, Turkestan.

Leperina mastersi, p. 163, *gayndahensis* and *burnettensis*, p. 164, Gayndah: Macleay, l. c., spp. nn.

COLYDIIDÆ.

Monotoma: Wollaston (Tr. E. Soc. 1871, p. 239) agrees with Motschoulsky in referring this to the *Colydiidæ*, but considers Lacordaire right in citing only 10 joints for the antennæ. *M. 4-dentata*, Thoms., = *brevicollis*, Aubé, sec. *descript.*, Rye, Ent. M. M. viii. p. 160; *parallela*, Thoms., = *quadricollis*, Aubé, sec. *descr.*, id. Ent. Ann. 1872, p. 71.

Tarphius wolffi, Woll., = *rugosus*, Woll., var., with which *truncatus*, Woll., also is possibly conspecific: Wollaston, l. c. p. 242 (*cf.* p. 243, note, for habits and localities &c. of various Madeiran spp. of this genus). *T. humerosus*, Fairm., *nec* Woll., is renamed *wollastoni*: Fairmaire, Ann. Soc. Ent. Fr. (4) x. p. 372 [*preocc.* by Crotch, 1867].

Xylotæmus: Ancey indicates capture of an unknown species at Marseilles which is to form a new genus nearest to this: Nouv. et faits, p. lxxxii.

Othismopteryx, g. n., J. Sahlberg, Not. Fenn. xi. p. 441. Intermediate between *Ditoma* and *Colydium*, differing from the former in its triarticulate club, distinct antennal furrows, and more approximated coxæ, and from the latter in its opaque, pubescent surface, and the structure of its head and thorax. *O. carinatus*, sp. n., J. Sahlb. l. c. p. 442, T. 1. f. 8 & 9, Yläne & Kolva, Finland (= *Bitoma*? *jelskii*, Wancowicz, 1867, for which that author has proposed the generic name *Lado*; Solsky, Hor. Ent. Ross. viii. p. 166; Kraatz, B. E. Z. xv. p. 206).

Tarphius lutulentus, sp. n., Wollaston, l. c. p. 240, Madeira.

Ditoma costata, sp. n., Macleay, l. c. p. 165, Gayndah.

Deretaphrus pascoei, sp. n., id. *ibid.*, Gayndah.

Bothrideres mastersi, *pascoi*, *kreffti*, p. 166, *suturalis*, p. 167, Gayndah: id. l. c., spp. nn.

Cerylon forticorne, Mulsant & Rey, Ann. Soc. L. Lyon, xviii. p. 95 (Op. Ent. xiv. p. 119), Gr. Chartreuse; *C. pygmæum*, Gerstäcker, Arch. f. Nat. xxxvii. p. 45, Zanzibar: spp. nn.

CUCUJIDÆ.

Pediacus depressus is recorded, and *Læmophlæus pusillus* corroborated, as British by Rye, Ent. M. M. vii. p. 205; the former is figured, Ent. Ann. 1872, frontisp. f. 2.

Sylvanus unidentatus, Woll., nec Ol., = *bidentatus*, F.: Wollaston, l. c. p. 245.

Læmotmetus, g. n., Gerstäcker, l. c. p. 45. Belongs to the *Passandridæ*. *L. ferrugineus*, sp. n., *id. ibid.*, Mombas, Zanzibar.

Placonotus, g. n., Macleay, l. c. p. 168. Resembles *Platissus*, Er., but with long filiform antennæ, of which the 1st joint is thick, 2nd, 3rd, & 4th nearly equal, slighter and shorter than the first, the rest long and slender. *P. longicornis*, sp. n., *id. ibid.*, Gayndah.

Prostomis laticeps, sp. n., *id. l. c.* p. 167, Gayndah.

Ipsaphes nitidulus, sp. n., *id. l. c.* p. 168, Gayndah.

Læmophlæus suffusus, sp. n., Wollaston, l. c. p. 244, Madeira.

Silvanus castaneus, sp. n., Macleay, l. c., Gayndah.

Omma mastersi, sp. n., *id. l. c.* p. 169, Gayndah.

OTHNIIDÆ.

Elacatis, Pascoe, originally referred by its author to the *Melandryidæ*, is identical with the posterior *Othnius* of Leconte. Pascoe agrees with the latter in placing it near the *Cryptophagidæ*, as a distinct family, for which he retains Leconte's name: Ann. N. H. (4) viii. p. 347. The tarsi in all American spp. appear to be heteromerous in both sexes: Horn, Tr. Am. Ent. Soc. 1871, p. 334.

Elacatis lyncea, p. 346, Ceylon, *laticollis*, p. 347, Pascoe, l. c., Batchian; *E. longicornis*, Horn, l. c., California: spp. nn.

CRYPTOPHAGIDÆ.

Cryptophagus pilosus is recorded from Madeira (with *saginitus*, *affinis*, and *dentatus*, all doubtless imported) by Wollaston, l. c. p. 246: *C. schmidtii*, Stm., is recorded as British by Rye, Ent. M. M., vii. p. 206 (*cf.* also p. 229), and *C. punctipennis* and *parallelus*, Bris., by Sharp, *ibid.*, viii. p. 158. *C. waterhousii*, Rye, is most likely identical with a var. of *acutangulus* mentioned by Thomson: Rye, *ibid.* vii. p. 274.

Hypocoprus lathridioides: J. Sahlberg, l. c. p. 433, records capture of many examples in Lapland, associated with *Formica exsecta*.

Atomaria fimetarii is recorded as occurring in fungus, in some numbers, at York, by Hutchinson, Ent. M. M. viii. p. 160; *A. badia*, Er., from Scotland, by Sharp (*ibid.* p. 74), who notices the discrepancy between Sturm's figure and Erichson's description; and *A. atra*, Hbst., from England by the Recorder, *ibid.* p. 135. Künstler (Verh. z.-b. Wien, xxi. Beih. p. 49) discusses injuries to cultivated plants by *A. linearis*.

Cryptophagus gracilipes, sp. n., Wollaston, Ann. N. H. (4) viii. p. 400, St. Helena (considered to have been imported).

LATHRIDIIDÆ.

Corticaria ciliata, Mots., is recognized as Madeiran by Wollaston (Tr. E. Soc. 1871, p. 247), who considers that *attenuata* and *unicarinulata*, Mots., are

not specifically distinct from it, that *flavifrons*, Mots., possibly = *inconspicua*, Woll., immat., and that *crenicollis*, Woll., probably = *fulva*, Mann., var.; he also records *transversalis*, Mann., from Madeira, doubtless an importation, and renames *delicatula* the Canarian *tenella* (sibi, nec Lec.). *C. obscura*, Bris., is recorded with some doubt as British by Rye, *l. c.* vii. p. 274.

Latridius nodifer now occurs in profusion at Madeira (at an elevation of 1600 to 1900 feet above Funchal): Wollaston, *l. c.* p. 252.

Corticaria latipennis, J. Sahlberg, *l. c.* p. 359, Lapland & Carelia; *C. polita*, Macleay, *l. c.* p. 160, Gayndah: spp. nn.

Latridius watsoni, sp. n., Wollaston, *l. c.* p. 253, Madeira (? imported), Chili.

MYCETOPHAGIDÆ.

Triphyllus fuscatus, sp. n., Macleay, *l. c.* p. 170, Gayndah.

Diplocephalus ovatus, sp. n., *id. ibid.*, Gayndah.

Mycetæa coquereli, sp. n., Fairmaire, Ann. Soc. Ent. Fr. (4) x. p. 372, Mers-el-Kébir.

THORICTIDÆ.

Thorictus seriesetosus, sp. n., *id. l. c.* p. 373, Tangiers.

DERMESTIDÆ.

Megatoma undata is recorded by Kuwert (S. E. Z. xxxii. p. 305) as breeding in cocoon of *Cimbex lutea* or *femorata*.

Trogoderma elongatulum, F., = *glabrum*, Hbst.: Harold, C. H. viii. p. 117.

Anthrenus goliath occurs on *Tamarix gallica*: Bauduer, Ann. Soc. Ent. Fr. (5) i. Bull. p. xxxix.

Hypoceuthes, g. n., Gerstäcker, Arch. f. Nat. xxxvii. p. 46. Differs from *Anthrenus* in its glabrous, very strongly and closely punctured surface, smaller eyes, and more acute and produced scutellar thoracic lobe. *H. aterrimus*, sp. n., *id. ibid.*, Kisumai, Zanzibar.

Attagenus pictus and *angustatus* [*sic*], Ballion, Bull. Mosc. xliii. p. 330, Turkestan: spp. nn.

Megatoma apicalis, sp. n., Macleay, *l. c.* p. 170, Gayndah.

Trogoderma hæmorrhœa, sp. n., Gerstäcker, *l. c.* p. 45, Endara, Zanzibar.

Anthrenus nigricans, Macleay, *l. c.* p. 171, Gayndah; *A. nocivus*, Mulsant & Godart, Ann. Soc. L. Lyon, xviii. p. 212 (Op. p. 240), Algeria: spp. nn.

Cryptorhopalum (? *gen. nov.*, *sec. auct.*) *obscurum*, sp. n., Macleay, *l. c.*, Gayndah.

Trinodes punctipennis and *globosus*, Macleay, *l. c.*, Gayndah: spp. nn.

BYRRHIDÆ.

Syncalyptra hirsuta, sp. n., Sharp, Ent. M. M. viii. p. 151, England.

Byrrhus pettiti, sp. n., Horn, Tr. Am. Ent. Soc. 1870, p. 76, W. Canada.

Microchætes fascicularis, p. 171, and *costatus*, p. 172, Macleay, *l. c.*, Gayndah: spp. nn.

Limnichus frontalis, sp. n., *id. ibid.*, Gayndah.

GEORYSSIDÆ.

Georyssus kingi, sp. n., *id. ibid.*, Gayndah.

PARNIDÆ.

HORN (*l. c.* Feb. 1870, pp. 29–42) gives a “Synopsis of the Parnidæ of the United States,” supplementing Leconte’s similar work. In the *Psephenides*, individuals with 6 abdominal segments and almost moniliform antennæ are ♀, the ♂ having an additional segment and subserrate antennæ.

Helichus foveatus, Lec., = *striatus*, *id.*; *gilensis* and *æqualis*, *id.*, = *suturalis*, *id.*: p. 33; *Limnius* and *Elmis* are generically non-separable: p. 34; *Stenelmis linearis*, Zimm., ? = *humerosus*, Mots.: Horn, *l. c.*

Elmis æneus, Müll. Laboulbène, Ann. Soc. Ent. Fr. (4) x. pp. 405–416, pl. 9, fully describes and figures with considerable detail the larva of this sp., of which former accounts seem to have been drawn up from dead and dried individuals. It appears to be closely allied to that of *Potamophilus*, and still more so to that of *Macronychus*, and to be readily distinguishable by the enlarged form of its thorax and the foliaceous fringes of the flattened lateral margins of the segments. The apex of its body is furnished with a respiratory apparatus, consisting of three fan-like bunches of branchiæ, starting each from a pedicle. *E. obscurus*, Müll., *subparallelus*, Fairm., and *rivularis*, Rosenh., are recorded from Algeria by Fairmaire, *ibid.* p. 373.

Psephenus trentonensis, Zimmerman, Tr. Am. Ent. Soc. 1869, p. 259, Trenton Falls (= *lecontei*, Lec.: Horn, *l. c.* p. 30); *P. haldemani*, Horn, *l. c.*, California: spp. nn.

Parnus pubescens [preoccupied], sp. n., Walker, List Col. Lord, p. 11, Arabia.

Elmis flum, Fairmaire, *l. c.*, Algeria; *E. syriacus* and *coyii*, Allard, L’Ab. v. p. 466, Syria [omitted from Zool. Rec. v.]; *E. 4-maculatus*, California, glaber and *mæstus*, Arizona, p. 37, *abnormis* and *similis*, p. 38, Arizona, ferrugineus, p. 39, Texas, Horn, *l. c.*: spp. nn.

Stenelmis 4-maculatus, sp. n., Horn, *l. c.* p. 40, Vermont, U.S.A.

Macronychus parvulus, sp. n., *id. ibid.*, California.

HETEROCERIDÆ.

Heterocerus mastersi, sp. n., Macleay, *l. c.* p. 173, Gayndah.

LUCANIDÆ.

Lamprimides.

Lamprima krefftii, sp. n., *id. ibid.*, Gayndah.

Lucanides.

Lucanus (Hexaphyllus) pontbrianti, Muls. De Narceillac, Ann. Soc. Ent. Fr. (5) i. Bull. p. lxxxvi, records an individual intermediate between this species [P] and *L. cervus*.

Dorcides.

Lissotes howittanus, Westw., ♀, is described and figured by the author, Tr. E. Soc. 1871, p. 369, pl. ix. f. 7 *a, b, c, d*; and *Dorcus pelorides*, Westw., has 1871. [VOL. VIII.]

nothing to do with it, as Parry has supposed, diagnostic characters for the ♀ of both being given. Westwood does not consider *Lissapterus*, Deyr., proposed for *hovittanus*, entitled to generic rank; he refers to it as unpublished, but the characters are given in Tr. E. Soc. 1870, p. 98 (cf. Parry, Tr. E. Soc. 1871, p. xlii). Westwood (*l. c.* p. 371) gives the characters of typical *L. caneroides*, F., comparing it with his *subtuberculatus*, and tabulating the males of the Tasmanian species.

Rhætus westwoodi is from the Himalayas, and *Dorcus derelictus*, Parry, is probably its ♀, *sec.* Parry: Westwood, *l. c.* p. 355.

Apterocyclus, g. n., C. O. Waterhouse, *ibid.* p. 315. Metasternum extremely short, elytra much rounded, tibiæ not spined, except the interm. pair in ♂; allied to *Sclerostomus*. *A. honoluluensis*, sp. n., *id. ibid.* (and fig. p. 316), Honolulu, Sandwich I.

Rhætulus, g. n., Westwood, *l. c.* p. 353. Allied to *Rhætus*, but with smaller head, which, with the prothorax, is subopaque, punctured elytra, denticulated anterior tibiæ, and the post. tibiæ with a small tooth in middle of outer edge, &c. *R. crenatus*, sp. n., *id. ibid.*, ♂, pl. viii. f. 4, Formosa (? ♀, p. 355).

Dorcus ratiocinativus, p. 356, pl. viii. f. 2, Himalaya (= *rudis*, Westw., ♂, *sec.* Parry—a view from which Westwood, who redescribes the latter at p. 357, and figures it, pl. viii. f. 3, dissents); *suturalis*, p. 358, pl. viii. f. 5, Pungi, Himalaya; *glabripennis*, p. 359, pl. viii. f. 6, E. India: Westwood, *l. c.*, spp. nn.

Lissotes furcicornis, p. 362, pl. ix. f. 3, Victoria; *latidens*, p. 363, *ib.* f. 4, I. Maria, Tasmania; *lancestoni*, p. 365, *ib.* f. 1, *forcipula*, p. 366, *ib.* f. 2 (and ? ♀, p. 367, *ib.* f. 6a, b), *subcrenatus*, p. 368, *ib.* f. 5a, b, Tasmania (cf. Zool. Rec. vii. p. 280): *id. l. c.*, spp. nn.

Figulides.

Figulus anthracinus, Klug, = *ebenus*, Westw., = *sublævis*, Palis.: Gerstäcker, Arch. f. Nat. xxxvii. p. 46.

Nigidiis parrii, Bates, is recharacterized and figured (pl. viii. f. 1) by Westwood, *l. c.* p. 360, who considers Bates's specimen and that figured by himself are ♀ (♂ in reference).

Passalides.

KAUP (B. E. Z. xv. Heft iv. pp. 1–125, pls. 3–7) monographs this subfamily (considered by himself a family) on the basis of his 'Prodromus' in v. Harold's Col. H. He gravely enunciates for it a quinary system, after the manner of Macleay or Swainson, supposed to be founded upon parallels afforded *inter se* by its members with relation to the various sections of the animal kingdom, and which he extends even to the limitation of the number of species contained in each genus. According to the author's ideas of natural propriety in this family, it ought to contain 325 species, neither more or less; and of these 154 yet remain to be discovered. At p. 37, the affinities of one of these *ignota* (possibly not as yet in existence, according to the sup-

porters of the view of separate and periodical creation) are by anticipation pointed out !

The following (with other) synonymy &c. is given :—*Aulacocyclus percheroni*, Kp., = *rosenbergi*, Kp. ; *Pass. tricornis*, Burm., = *bihastatus*, Perch., = *fronticornis*, Westw. ; *Comacupes levicornis*, Kp., = *cavicornis*, Burm. ; *P. hardwicki*, Hope, = *Tæniocerus bicuspis*, Kp. ; *Pass. dasypleurus*, Imh., = *Erionomus planiceps*, Esch. ; *P. africanus*, Perch., = *parastictus*, Imh. ; *Pass. gorii*, Thoms., = *mniszehi*, Kp. ; *P. laticornis*, Kp., = *Pseudacanthus mexicanus*, Truqui ; *punctifrons*, Dej., is adopted for the meaningless *Pass. cajor*, Perch. ; *Neleides multispinosus*, Kp., = *incertus*, Perch. ; *Pass. laborator*, Kp., = *Ninus punctatissimus*, Esch. ; *Pass. compar*, Er., = *acuminatus*, Esch., = *interstitialis*, Esch. ; *Pass. cognatus*, Truq., = *Rhodocanthopus maillii*, Perch. ; *P. longulus*, Perch., = *R. morio*, Perch. ; *P. nodus*, Apetz, = *thoracicus*, Sm., = *Ptichopus angulatus*, Perch. ; *P. erosus*, Truq., = *binominatus*, Perch. ; *Phoroneus obtusidens*, Kp., = *aduncus*, Er. ; *Pass. subcornutus*, Hope, = *Soranus tropicus*, Perch. ; *P. semicylindricus*, Esch., = *Veturius assimilis*, Web. ; *P. validus*, Burm., = *V. platyrhinus*, Reiche.

The author figures, Taf. iii., portions of *Aulacocyclus teres*, Perch., f. 1, and of *Ceracupes fronticornis*, Westw. f. 2 ; *Comacupes basalis*, Er., with detail, f. 3 ; portions of *C. cylindraceus*, Pty., f. 4, of *C. tricuspis*, Kp., f. 5, *Tæniocerus bicanthatus*, Guér., f. 6, and of *Caulifer macleayi*, f. 7 ; Taf. iv., *Pleurostylus pilipes*, Kp., with detail, f. 1, *Labienus ptoz*, f. 2, *Eriocnemis mniszehi*, Kp., with detail, f. 3, *Plesthenus 4-cornis*, Kp., with detail, f. 4, *Laches comptoni*, Kp., with detail, f. 5, and part of *Macrolinus duivenbodi*, Kp. ; Taf. v., *Proculus gorii*, Melly, f. 1, *P. mniszehi*, Kp., f. 2, *P. opacipennis*, Thoms., f. 3 ; Taf. vi., the first two segments of the following spp., *Pseudacanthus mexicanus*, Truq., f. 1, *Spurius bicornis*, Truq., f. 2, *Mitrorhinus punctifrons*, Dej., f. 3, *Eumelus lunaris*, Kp., f. 4, *Phoroneus rugifrons*, Kp., f. 5, *P. denticollis*, Kp., f. 6, *Epiphanus abortivus*, Perch., f. 7, *E. glaberrimus*, Esch., f. 8, *Paxillus pentaphyllus*, Beauv., f. 9, *Pertinax pertii*, Kp., f. 10, *Neleides affinis*, Perch., f. 11, *N. incertus*, Perch., f. 12 ; Taf. vii., the like segments of *Passalus distinctus*, Web., f. 1, *Soranus wagneri*, Kp., f. 2, *S. recticornis*, Kl., f. 3, *Veturius cephalotes*, Dej., f. 5, *V. transversus*, Dalm., f. 6, *Verres corticola*, Truq., f. 7, *V. furcillabris*, Esch., f. 8, also *Veturius platyrhinus*, Reiche, with detail, f. 4 : all these being magnified in various specified degrees.

In addition to the genera mentioned in Zool. Rec. v. pp. 232 & 233, and vi. pp. 244–246, the following (apparently new) are now characterized :—(Eastern hemisphere) *Ceracupes*, p. 16, *Comacupes*, p. 17, *Caulifer*, p. 22, *Pleurostylus*, p. 25, *Semicyclus*, p. 28, *Ciceronius* and *Didymus*, p. 29, *Trichostigmus*, p. 31, *Velleius* [preoccupied], p. 35, *Pelops*, p. 37, *Labienus*, p. 39, *Plesthenus*, p. 40, *Macrolinus*, p. 42, *Episphenus*, p. 45, *Laches*, p. 48, *Gonatas*, p. 50, *Ceteius*, p. 53, *Basilianus*, p. 55 ; (Western hemisphere) *Ogyges*, p. 69, *Publius*, p. 70, *Spurius* and *Popilius*, p. 75, *Vindex*, p. 78, *Mitrorhinus*, p. 79, *Ninus*, p. 89, *Rhodocanthopus*, p. 90, *Rhagonocerus*, p. 97, *Epiphanus*, p. 98, *Eumelus*, p. 102, *Soranus*, p. 107, *Veturius*, p. 110, *Sertorius* and *Verres*, p. 114, *Rimor*, p. 119 ; and the following spp. nn. are described :—*Caulifer macleayi*, p. 22, Sydney ; *Pleurostylus trapezoides*, p. 26, ? Africa ; *Semicyclus grayi*, p. 28 (no locality) ; *Pelops salomonis*, p. 39, I. Salomons ; *Eriocnemis dorsalis*, p. 41, Java ; *Macrolinus waterhousii*, p. 43, Ceylon ; *M. rotundifrons*,

p. 44, Ceylon, China; *Episphenus moorii*, p. 45, Ceylon; *Aceraius borneanus*, Borneo, and *kaupi*, Java, p. 52; *A. percheroni*, p. 53, Java; *Ceteius halmaherae*, p. 54 (no locality); *Proculeius quitensis*, p. 63, Quito; *Neleides geometricus*, p. 88, Brazil (doubtfully distinct); *Sertorius agassizi*, p. 114, Guatemala; *Verres intermedius*, p. 115, Mexico; *V. haageni*, p. 116, Guatemala; *Rimor sargii*, p. 119, Mexico.

Aulacocyclus kaupi, sp. n., Macleay, l. c. p. 173, Gayndah.

Tæniocerus masteri, sp. n., id. l. c. p. 174, Gayndah.

Mastachilus nitidulus, *ibid.*, *puncticollis*, p. 175, Gayndah: id. l. c., spp. nn.

SCARABÆIDÆ.

MULSANT, Ann. Soc. Agric. Lyon (4), ii. pp. 241–650, under the heading “Tribu des Lamellicornes,” commences a revision of the French species, exhaustively discussing the *Coprides* and *Aphodiides*. New species described in it are attributed to the author, in conjunction with Rey.

Horn (Tr. Am. Ent. Soc. iii. Feb. 1870, pp. 42–51) gives “Notes on some genera of Coprophagous Scarabæidæ of the United States,” briefly describing spp. of *Pinotus*, *Copris*, *Canthon*, *Bolboceras*, *Odontæus*, *Onitis*, and a genus proposed for the American spp. of *Athyreus*.

Candèze (Ann. Ent. Belg. xiv. c.-r. p. xxiii) records many specimens of 42 exotic spp. of Lamellicorns, taken at Verviers in wool coming from Buenos Ayres. Some few are of great rarity, and 6 indicated as new.

v. Harold (C. H. viii. pp. 1–28) describes *Coprophaga* found by Beccari in Bogos, N. Abyssinia.

Coprides.

Ateuchus ægyptiorum, Latr. Gerstäcker, Arch. f. Nat. xxxvii. p. 48, describes a var., *purpurascens*, from Zanzibar.

Gymnopleurus geoffroyi, Füssl., is to be used for *mopsus*, Pall., *pilularius*, F., being erroneously referred to Linnæus's sp. of that name, which is a *Canthon* (*hudsonias*, Först., *lævis*, Drury); *Phanæus palæno*, Blanch., nec Vigors, is named *blanchardi*; the earlier of the two *Onitis sphinx* of Fab., altered to *inuus*, is to keep the former name, the latter retaining *spinipes*, Drury; *Onthophagus castaneus*, Klug, is a *Cuccobius*; *latifrons*, Buq., = *carbonarius*, Kl., nec *interstitialis*; *nutans*, F., = *verticicornis*, Laich., which must stand; *taurus*, L., = *rugosus*, Poda, which stands; *rugosus*, Kby., nec Poda, is named *tenebrosus*; *Oniticellus flavipes*, F., = *fulvus*, Goeze, which stands: Harold, l. c. vii. p. 114. *Gymnopleurus granulatus*, F., nec Ol., is changed to *gemmatus*; *Epirinus scabratus*, F., = *granulatus*, Ol.; *Onthophagus thoracicus*, Ol., = *bidens*, Ol., ♀: id. l. c. viii. p. 117 et seq.

Gymnopleurus profanus, Latr., = *wahlbergi*, Boh., = *splendidus*, Bertol.; *lævicollis*, Cast., = *pumilus*, Reiche, = *gibbosus*, Roth, = *virens*, Fr.; *Ateuchus horridus*, Boh., = *femoralis*, Kby.; *Onitis alexis*, Dej., = *inuus*, Ol.; *Onthophagus aulicus*, Dej., = *lanista*, Cast.; *collaris*, Boh., = *loricatus*, Klug; *gazella* and *metallicus*, F., ♂, = *catta*, F.; *Oniticellus pallens*, Cast., = *nasicornis*, Reiche: Gerstäcker, l. c.

Canthon speciosus, Har., = *cyanellus*, Lec.; *abrasus*, Lec., = *probus*, Germ.;

corvinus, Har., = *simplex*; Lec., and two other varr., *militaris* and *humeralis*, are described from California: Horn, *l. c.* p. 45 *et seq.*

Copris isidis. The sexual frontal peculiarities of this and other spp. are figured in Darwin's 'Descent of Man,' p. 369 *et seq.*

Onthophagus rubrimaculatus, MacL., is not a syn. of *4-pustulatus*, F., as Gem. and v. Harold state. The reference by the latter authors of *O. furcatus* and *laminatus*, MacL., to *auritus*, Er., and *capella*, Kby., respectively, is equally erroneous; and the description of *O. cuniculus*, MacL., is amended: Macleay, *l. c.* pp. 178 & 179. *O. sticticus*, Har., occurs also in Algeria; *O. analis*, Luc., = *sellatus*, Klg.: Harold, L'Ab. v. p. 434 [omitted from Zool. Rec. v.].

New genera and species:—

Canthonosoma, Macleay, *l. c.* p. 175. Belongs to Lacordaire's *Deltotichilides*; distinct from all other Australian long-legged *Coprides*, by wanting the anterior tarsi. *C. mastersi*, *id. l. c.* p. 176, Gayndah.

Merodontus, *id. l. c.* p. 177. Strongly resembles *Sisyphus*, but with deep epipleuræ, and belongs to Lacordaire's *Minthophilides*. *M. calcaratus*, *id. l. c.* p. 178, north of New Holland.

Stiptopodius, Harold, C. H. viii. p. 5. Very closely allied to *Onthocharis*, but hairy above, with 8-jointed antennæ, a flatter metasternum, and the ant. tibiæ straight and not widened on the inner side, and with a longitudinal smooth keel beneath. *S. dorice*, *id. l. c.* p. 7, N. Abyssinia.

Homalocopris, Solsky, Hor. ent. Ross. viii. p. 136, T. v. f. 1. *H. (Copris) tmolus*, Fisch. (this genus = *Snyapsts*, Bates, and *S. brahmina*, Hope, = *tmolus*, Fisch., sec. Harold, *l. c.* vii. p. 129).

Scarabæus (Ateuchus) venerabilis, Harold, *l. c.* viii. p. 2, N. Abyssinia; *A. æratus* (and var. *minor*), *pustulosus*, and (*Actinophorus*) *catenatus*, Gerstäcker, *l. c.*, Zanzibar.

Sisyphus nodifer and *seminulum*, *id. l. c.* p. 49, Zanzibar.

Anachalceus procerus, *id. ibid.*, Moschi, Zanzibar.

Gymnopleurus umbrinus, *id. ibid.*, Zanzibar; *G. violaceus*, Ballion, Bull. Mosc. xliii. p. 331, Turkestan (= *aciculatus*, Gebl.: Harold, *l. c.* viii. p. 135); *G. obtusus*, Mulsant & Rey, *l. c.* p. 298, Basses-Alpes.

Cephalodesmus quadridens, Macleay, *l. c.* p. 176, Gayndah.

Temnoplectron tibiale, *id. l. c.* p. 177, Gayndah.

Coptorrhina granulifera, Harold, *l. c.* vii. p. 112, Natal.

Canthidium magnum, *id. l. c.* viii. p. 114, Brazil.

Heliocopris beccarii, *id. ibid.* p. 8, N. Abyssinia.

Phanæus guatemalensis, *id. ibid.* p. 114, Guatemala.

Onitis sterculiæ and *haroldi*, Ballion, *l. c.*, Turkestan.

Onthophagus ineptus, p. 12, *tessulatus*, p. 13, *helciatus*, p. 14, N. Abyssinia; *wallacii*, Celebes, Sunda, p. 114; *pennsylvanicus*, Pennsylvania, *tuberculifrons*, Carolina, *lecontii*, N. Mexico, *crotchii*, Australia, p. 115; *depressus*, p. 116, Caffraria: Harold, *l. c.* viii. *O. pinguis*, *exasperatus*, *laceratus*, p. 50, *picticollis*, *aterrimus*, *tumidulus*, *ovulum*, *sculptilis*, p. 51, *morosus*, *lamelliger*, p. 52: Gerstäcker, *l. c.*, Zanzibar. *O. saiga* and *haroldi*, Ballion, *l. c.* p. 332, Turkestan. *O. crocatus*, Mulsant & Godart, Ann. Soc. L. Lyon, xviii. p. 315, Algeria. *O. divaricatus*, p. 179, *rubicundulus*, p. 180, *perpilosus*, *incornutus*, *mastersi*,

p. 181, *desectus*, *quinquetuberculatus*, p. 182, *inermis*, p. 183: Macleay, l. c., Gayndah.

Oniticellus humilis and *cælatus*, Gerstäcker, l. c. p. 52, Zanzibar.

Aphodiides.

HORN has published two papers in Tr. Am. Ent. Soc.,—"Description of the species of *Aphodius* and *Dialytes* of the United States" (l. c. 1870, pp. 110-134), and, in continuation, "Synopsis of *Aphodiini* of the United States" (l. c. 1871, pp. 284-297),—in which he tabulates and describes the American spp. of the 2 genera above named, *Oxyomus*, *Atenius*, *Euparia*, *Rhyssemus*, *Pleurophorus*, *Psammodius*, and *Ægialia* (errata in 1st paper noticed at p. 296 of 2nd).

The European *Psammodius cæsus*, *Aphodius fossor*, *fimetarius*, *fætibus*, *granarius*, and *inquinatus* are noticed as also occurring in America; *A. sagittarius*, Har., = *angularis*, Lec. (*hamatus*, Say); *omissus*, Lec. (*concaus*, Hald.) = *hyperboreus*, Lec.; *aurelianus*, Har., = *curtus*, Hald., = *ruricola*, Mels.; *Atenius sordidus*, Har., = *imbricatus*, Mels. Various portions of the external anatomy of *Aphodius* and *Dialytes*, especially of *A. pinguis* and *denticulatus*, Hald., *oblongus*, *concaus*, and *serval*, Say, *dentiger* and *pardalis*, Lec., *inquinatus*, F., and the author's *phalerioides*, *walshi*, *nevadensis*, *torpidus*, *crassulus*, and *rugifrons*, are given on pl. iii. (for description, cf. p. 324).

v. HAROLD (B. E. Z. xv. pp. 249-287), in the long-delayed 7th part of his "Beiträge zur Kenntniss einiger coprophagen Lamellicornien," discusses the characters of many spp. not universally known, redescribing many and describing some as new. He gives the following synonymy &c.:—*Aphodius tasmaniae* = *howitti*, Hope, ♀, of which *australasie*, Blanch. (*dilatocollis*, Dup.) is the ♂; *capicola*, Har., = *rufipes*, L.; *rutilipennis* (Helf. MS.), Er., = *trucidatus*, Har.; *taniatus*, Woll., = *lucidus*, Klug; *lineellus*, Har., and ? *flagrans*, Er., = *strigilatus*, Roth; *varians*, Dufts. (1805), is adopted for *bimaculatus*, F. (1787), *nec* Laxmann (1770), with whose sp. *coccinelloides*, Pz., and *bipunctatus*, F., are stated to be identical; *longulus*, Mén., = *plagiatus*, L.; *flavocinctus*, Har., = *innexus*, Say; *schmidtii*, Heer, = *alpinus*, Scop.; *scutellaris*, Roth, ex typ., = *lividus*, Ol.; *corvinus*, Er., is an *Ammæcius*.

Aphodius lucasi, Har., = *affinis*, Luc., *nec* Panz., = *ater*, Deg., var.; *ascendens*, Reiche, = *ater*, Deg., var. *convexus*, Er.; *affinis*, Er., and *suturalis*, Fald., = *granarius*, L.; *rapax*, Fald., = *prodromus*, Brm., ♂: *id.* L'Ab. v. pp. 434 & 435 [omitted from Zool. Rec. v.]. *A. lutarius*, Payk. (1798) = *tomentosus*, Müll. (1776): *id.* C. II. vii. p. 115. *A. fætibus*, F., = *putridus*, Hbst., which stands; *putridus*, Stm., is changed to *sedulus*: *id.* l. c. viii. p. 119. *A. mutans*, Walker, = *mæstus*, F.: Gerstäcker, Arch. f. Nat. xxxvii. p. 47. *A. cognatus*, Fairm., should stand for *brunneus*, Klug, *nec* Thunb.; *mixtus*, Mots., *nec* Villa (= *abdominalis*, Bon.), and *thoracicus*, Roth, *nec* Fisch., require renaming, *senegalensis*, Reche., *nec* Klug, not standing for the latter: Ballion, Bull. Mosc. xlv. pp. 153 & 154.

Ammæcius. Harold (C. H. vii. pp. 1-20) revises this genus. According to him, *transsylvanicus*, Küst., probably = *gibbus*, Germ., var.; *nitidus*, Küst., probably = *brevius*, Er.; *terminatus*, Harold, = *lugubris*, Boh.; and he describes, without naming, an unrecorded species.

Rhyssenus granosus, Mots., nec Kl., is named *granulosus*: Ballion, l. c. p. 154. *R. asper*, F., and *Psammodius cæsus*, Pz., occur in Madagascar: Fairmaire, Ann. Soc. Ent. Fr. (5) i. p. 34.

New genera and species :—

Simogonius, Harold, l. c. viii. p. 22. Allied to *Dialytes*, but with posterior angles of thorax inflexed, and inflexed portion obtusely keeled above; anterior tibiæ scalpriform at apex. *S. beccarii*, *id. ibid.*, N. Abyssinia.

Hexalus, Mulsant & Rey, Ann. Soc. L. Lyon, xviii. p. 168 (Op. Ent. xiv. p. 200). No differential characters given. *H. simplicipes*, *id. ibid.*, ? Loudun.

Oloperus, *id.* Ann. Soc. Agric. Lyon (4), ii. p. 610. Forms a transition between *Plagiogonus* and *Pleurophorus*. *O. nanus*, Fairm.

Dimalia, *id. ibid.* p. 647. Allied to *Ægialia*, but with distinct claws; posterior tibiæ narrow, slightly denticulated externally, outer calcar parallel. *D. (Ægialia) sabuleti*, auct.

Aphodius frater, p. 171 (Op. p. 203), Batoun; *politus (Nialus)*, p. 172 (Op. p. 204), Syria; *orophilus (Therilus)*, p. 174 (Op. p. 206), Caucasus; *stercorarius (Megalus)*, l. c. p. 176 (Op. p. 208), Mesopotamia; *ephippiger (do.)*, l. c. p. 186 (Op. p. 210), Arabia; *nitens (Erytus)*, l. c. p. 187 (Op. p. 211), Bône; *solieri (Anomius)*, l. c. p. 188 (Op. p. 212), S. France; *badius (do.)*, l. c. p. 190 (Op. p. 214), Spain; *signifer*, l. c. p. 192 (Op. p. 216), Syria; *cinereus (Trichonotus)*, l. c. p. 194 (Op. p. 218), Sicily; *syriacus (Melinopterus)*, l. c. p. 196 (Op. p. 220), Syria: Mulsant & Rey, Ann. Soc. L. Lyon, xviii. (Op. Ent. xiv.). *A. hypocrita*, *id.*, Ann. Soc. Agric. Lyon (4), ii. p. 449, no locality given. *A. sordescens*, p. 431, Siberia, *angulosus*, p. 432, Palestine, *hilaris*, p. 433, M. Persia: Harold, L'Ab. v. [omitted from Zool. Rec. v.]. *A. solskii*, p. 251, Japan, E. Amoor; *buxeiennis*, p. 255, note, C. G. Hope; *armiger*, p. 259, Greece; *oleosus*, p. 260, Mexico; *tetricus*, p. 263, Abyssinia; *calidus*, p. 277, Senegal; *digitatus*, p. 278, Egypt; *dolosus*, p. 280, S. Africa; *fallax*, p. 281, C. G. Hope: *id.* B. E. Z. xv. *A. heydeni*, Asturias, *gregarius*, Sarepta: *id.* C. H. vii. p. 112; *parvulus*, p. 17, *doriæ*, p. 18, *expertus*, p. 19, *erugatus*, p. 20, N. Abyssinia: *id.* l. c. viii. *A. anthrax*, Gerstäcker, l. c., Uru, Zanzibar. *A. cervorum*, Fairmaire, l. c. (5) i. p. 420, Fontainebleau. *A. pallescens*, Walker, List Col. Lord, p. 11, and *micros*, *id.* l. c. p. 12, Harkeko [most inadequately characterized]. *A. intermedius*, p. 332, *nitidus* and *præustus*, p. 333, Turkestan, *maculicollis* (preoccupied, and = *gregarius*, Har.: Harold, C. H. viii. p. 135), *id.*, S. Siberia, Ballion, Bull. Mosc. xliii. *A. geminatus*, Macleay, l. c. p. 183, Gayndah. *A. validus*, p. 112, Hudson's Bay Territory, *torpidus*, Salt Lake, *occidentalis*, Oregon, p. 114, *crassulus*, Georgia, Florida, p. 118, *nevadensis*, Nevada, *vestiarius*, Florida, p. 121, *stupidus*, Georgia, *lentus*, Pennsylvania, p. 125, *rubiginosus*, Arizona, *ægrotus*, N. Carolina, p. 127, *politus*, Texas, p. 128, *alternatus*, p. 129, *ovipennis*, p. 133, California, *coloradensis*, Colorado, p. 130, *phalerioides*, Mid. States, p. 131, *walshi*, Illinois, *rubripennis*, Canada, Pennsylvania, p. 132, *ochreipennis* and *rugifrons*, California, p. 295: Horn, l. c.

Oxyomus opacifrons, Horn, l. c. p. 284, Middle States.

Amnæcius obscurus, *erenatipennis*, *semicornutus*, p. 184, *nitidicollis*, p. 185, Macleay, l. c. Gayndah; *A. bidentulus*, Harold, C. H. vii. p. 19, C. G. Hope.

Euparia ovalipennis, *id.* l. c. viii. p. 116, Argentine Rep.

Rhyssenus rubeolus, *id. ibid.* p. 25, N. Abyssinia; *R. californicus*, California, *riparius*, Arizona, Horn, *l. c.* p. 290.

Atanius horticola, Harold, *L'Ab.* v. p. 429, Constantinople (but see observations at p. 430 as to its probably American origin); *spinicollis*, *id.* C. H. viii. p. 23, N. Abyssinia. *A. robustus*, p. 285, Missouri, *oblongus*, California, *ovatus*, Pennsylvania, Louisiana, p. 286, *lobatus*, California, *socialis*, Georgia, Louisiana, p. 287, *hirsutus*, Arizona, *lucanus*, L. California, p. 288, *cylindrus*, S. Carolina, *desertus*, California, p. 289: Horn, *l. c.*

Psammодиус poricollis, Fairmaire, *l. c.* (4) x. p. 374, Boussada; *P. (Platytomus) laticeps*, *id. l. c.* (5) i. p. 34, Madagascar; *P. scabrifrons*, Walker, *l. c.* p. 12, Cairo; *P. foveicollis*, Ballion, *l. c.* p. 333, Turkestan; *P. quinqueplicatus*, p. 292, ? Arizona, *bidens*, p. 293, Southern States, Horn, *l. c.*

Psammobius basalis, Mulsant & Rey, *Ann. Soc. Agric. Lyon* (4) ii. p. 636, Provence.

Ægialia marmottani, Fairmaire, *l. c.* (4) x. p. 374, Biskra; *Æ. conferta*, Horn, *l. c.* p. 294, M. & S. States and Illinois.

Orphnides.

Hybalus tingitanus, Fairm., = *dorcas*, F.; *dorcas*, auct., must resume the name of *cornifrons*, Guér.; *barbarus*, Cast., probably = *parvicornis*, Luc., but should be disregarded for insufficiency of description: Fairmaire, *l. c.* (4) x. p. 375.

Hybalus subcornutus, sp. n., *id. ibid.*, Tangiers.

Hybosorides.

Phæochrous (Silphodes) indicus, Westw., = *emarginatus*, Casteln., ♀; *S. gambiensis*, Westw., ? = *senegalensis*, Cast.: Harold, C. H. viii. p. 28.

Phæochrous beccarii, sp. n., *id. l. c.* p. 26, N. Abyssinia.

Geotrupides.

Bolboceras nigriceps, Westw., *nec* Wied., requires renaming: Ballion, *Bull. Mosc.* xlv. p. 154.

Geotrupes polyceros, Pall. (1771), is to stand for *ammon*, Harold, C. H. vii. p. 115; *G. boas*, F., *daldorffi*, Gmel., = *æson*, F., *id. l. c.* viii. p. 120.

Geotrupes vernalis and its allies are discussed by Sharp (*Ent. M. M.* viii. pp. 8-11), according to whom *lævis*, St., *autumnalis*, Er., *alpinus*, Hag., *obscurus*, *violaceus*, *varians*, and *splendens*, Muls., and probably *purpureus*, Küst., and *amedei*, Fairm., are to be referred to that sp., and *vernalis*, Steph., *politus*, Muls., *coruscans*, Chevr., and probably *splendens*, Zieg., to *pyreneus*, Charp., characters being given for these 2 spp.

Geotrupes stercorarius: diagnostic characters for this and *mesoleius*, Thoms. (*stercorarius*, Er., *nec* L.), are recapitulated by Rye, *Ent. M. M.* viii. p. 108.

Lethrus cephalotes, Künstler (Verh. z.-b. Wien, xxi. Beih. p. 87) discusses injuries to cultivated plants from this sp.

Amechanus, g. n., Horn, *l. c.* p. 48, figs. 1 & 2: to receive the 3 American spp. of *Athyreus* (*ferrugineus*, Beauv., *fossatus*, Hald., & *serratus*, Lec.), which have a broad triangular scutellum with rounded sides, not depressed below the level of the elytra. The generic name, being preoccupied in *Cerambycidae*, is changed to *Bradycinetus*, Horn, *l. c.* 1871, p. 334.

Bolboceras gayndahense, sp. n., Macleay, l. c. p. 185, Gayndah.

Athyreus flavohirtus, sp. n., Walker, List Col. Lord, p. 12, Arabia.

Geotrupes (*Sternotrupes*) *caucasicus*, Sharp, l. c. p. 10, Persath (= *molestus*, Fald., teste Deyrolle, Pet. nouv. p. 145); *murrayi*, Ballion, l. c. xliii. p. 334, Kapal: spp. nn.

Lethrus lævigatus, p. 334, *acutangulus*, *turkestanicus*, p. 335, *rosmarus*, *impressifrons*, *microbuccis*, p. 336, *pygmaeus*, *tuberculifrons*, p. 337, *breviceps*, *bituberculatus*, p. 338, Russia: Ballion, l. c. spp. nn.

Trogides.

Trox alternans, Lec., nec MacL., requires renaming: Ballion, Bull. Mosc. xliv. p. 154.

Trox dohrni, Harold, C. H. vii. p. 112, K. George's Sound; *crotchii*, id. l. c. viii. p. 116, Queensland; *T. madagascariensis*, Fairmaire, Ann. Soc. Ent. Fr. (5) i. p. 34, Nossi-Bé; *T. quadrimaculatus*, Ballion, l. c. xliii. p. 338, Turkestan; *T. squamosus*, *salebrosus*, and *semicostatus*, Macleay, l. c. p. 186, Gayndah: spp. nn.

Glaphyrides.

Amphicoma kuschakewitschi, sp. n., Ballion l. c. p. 339, Turkestan.

Lichnanthe edwardsi, sp. n., Horn, Tr. Am. Ent. Soc. 1870, p. 77, Oregon.

Melolonthides.

Hoplia peroni, Blanch.: Wollaston (Tr. E. Soc. 1871, p. 256) considers the reference of this or any other *Hoplia* to Teneriffe to be most probably erroneous.

Pleophylla: Schaufuss (Nunq. Ot. i. p. 231) reproduces the descriptions of the known members of this genus.

Macroductylus subspinosus, F.: an account of its habits is given in i. Rep. Ins. Ont. p. 78.

Rhizotrogus marginipes and *cicatricosus*, Muls., *ochraceus*, Knoch, and *ruficornis*, F.: Rosenhauer (S. E. Z. xxxii. pp. 408-411) describes the habits of these spp. near Erlangen, and briefly redescribes *cicatricosus*.

Rhizotrogus granulifer, Rosenh., *geniculatus*, Chev., = *marginipes*, Muls., ♀: des Loges, Mitth. Schw. ent. Ges. iii. p. 375.

Polyphylla alba (1773) is to stand for *hololeuca*, Pall.; *Sparmannia vertumnus*, Pall., is to stand for *alopez*, F., Harold, C. H. vii. p. 116; *Hoplia fuesslini*, Moll., = *philanthus*, Slz., id. l. c. viii. p. 121.

Melolontha vulgaris. Künstler (Verh. z.-b. Wien, xxi. Beih. p. 1) discusses injuries to cultivated plants from this sp. Mulsant, in Proc.-verb. Ann. Soc. Agric. Lyon (4), i. pp. liv & lxx, discusses means for destroying this pest: cf. also Sauzey, *ibid.* ii. p. cxix. Von Gorup-Besanez (S. B. Soc. Erlang. 1871, p. 70) gives particulars of the constituent elements and properties of a new chemical substance detected by Schreiner in this insect, and which he proposes to call melolonthin. Bedel (Nouv. et faits, p. lxxxvi) gives a list of spp. of *Coleoptera* (many rare) found by him at Calvados upon the sea-shore, under layers of cockchafers brought by the wind.

New genera and species :—

Odontotonyx, Macleay, *l. c.* p. 193. Allied to *Heteronyx*. *O. brunneipennis*, *id. l. c.* p. 197, Gayndah.

Homalotropus, *id. l. c.* p. 193. Near *Xylonychus*, but more naturally allied to the *Heteronychides* than the true *Melolonthides*, with which that genus is associated by Lacordaire. *H. luridipennis*, *id. ibid.*, Gayndah.

Empycastes, Gerstäcker, Arch. f. Nat. xxxvii. p. 47. Differs from *Psilonychus* in its more slender antennal club, deeply trisinate and 4-dentate clypeal margin, auriculate-recurved anterior angles of thorax, cordiform scutellum, &c. *E. coronatus*, *id. ibid.*, Zanzibar.

Pectinichelus, Ballion, Bull. Mosc. xliii. p. 340. Facies of *Rhizotrogus*, but claws of all tarsi armed at the apex with an acute denticle, and pectinated at the base. Distinguished from *Listronyx* by its 10-jointed antennæ, of which the clava is trifoliate; and from *Listrochelus* by the tooth and cleft of its claws. *P. rhizotrogoides*, *id. ibid.*, Dschulpash, Russia.

Phyllotocus sericeus and *varicollis*, Macleay, *l. c.* p. 187, Gayndah.

Serica fusca and *renardi*, Ballion, *l. c.* p. 339, Russia; *S. ariasi*, Muls. & Rey, Ann. Soc. L. Lyon, xviii. p. 317, Escorial; *S. elongatula*, Horn, Tr. Am. Ent. Soc. 1870, p. 77, California.

Pleophylla flavicornis and *opalina*, Schaufuss, Nunq. Ot. i. p. 232, Caffraria.

Machidius variolosus, *obscurus*, *rugosicollis*, p. 188, *parvulus*, p. 189, Gayndah: Macleay, *l. c.*

Liparetrus fulvohirtus, *sericeus*, p. 189, *pilosus*, *pallidus*, *flavopilosus*, p. 190, *rufiventris*, *tridentatus*, *glaber*, p. 191, *parvulus*, p. 192, Gayndah: *id. l. c.*

Scitala suturalis and *armaticeps*, Gayndah, *id. l. c.* p. 192.

Haplonycha pinguis, *id. l. c.* p. 193, Gayndah.

Heteronyx holosericeus, *pubescens*, *castaneus*, p. 194, *substriatus*, *infuscatus*, *pallidulus*, p. 195, *concolor*, *ruficollis*, *rugosipennis*, p. 196, Gayndah: *id. l. c.*

Pachydema pilosum, Walker, List Col. Lord, p. 12, Arabia.

Tanyproctus opacus, Ballion, *l. c.* p. 339, Turkestan.

Rhizotrogus myschenkowi, *glabripennis*, *hispidus*, p. 341, *grandicornis*, p. 342, Russia, *id. l. c.*; *R. sordescens*, p. 375, Mogador, *stigmaticollis*, p. 376, *castanopterus*, p. 377, and *brunneus*, p. 378, Algeria, Fairmaire, Ann. Soc. Ent. Fr. (4) x.; *R. inundationis* and *eburneicollis*, Bône, and *atlanticus*, Médéah, Raffray, Pet. Nouv. p. 160 (diagnoses only).

Amphimallus logesi, Mulsant & Godart, Ann. Soc. L. Lyon, xviii. p. 214, S. Italy.

Ancylonycha dilaticollis, Ballion, *l. c.* p. 342, Turkestan.

Anoxia 7-foliata, p. 356, Algeria (= *Polyphylla mauritanica*, Lucas, sec. Reiche, *ibid.* p. 428); *asiatica*, p. 357, Asia Minor: des Loges, Mitth. Schw. ent. Ges. iii.

Polyphylla pulvereæ, Ballion, *l. c.* p. 342, Turkestan.

Melolontha cuprescens and *gracilicornis*, Blanchard, C. R. lxxii. p. 811, note, Thibet (diag. only); *M. afflicta*, Turkestan, *spatulata* (quoted as Steven's, but given as new), Caucasus, Ballion, *l. c.* p. 343.

Elaphocera aristidis (diag. only), Raffray, Pet. Nouv. p. 160, Tlemcen.

Rutelides.

Anisophia: Künstler, *l. c.* p. 25, discusses injuries to cultivated plants caused by members of this genus.

Phyllopertha and *Anisophia*: Fairmaire, Ann. Soc. Ent. Fr. (4) x. p. 378, enumerates the recorded Algerian spp., proposing to sink the former genus in the latter, and in that case renaming *deserticola*, Luc. (*nec* Fisch.), *lucasi*. *P. lineolata*, Fisch., was erroneously recorded by Fairmaire as Algerian; the sp. should have been *lineata*, F. Burmeister's description of *Anisophia pallidipennis*, Gyll., is reproduced.

Phyllopertha horticola: Künstler, l. c. p. 79, discusses injuries to cultivated plants from this sp.

Strigoderma glabrata, F., is to stand for *marginata*, Ol.: Harold, C. H. vii. p. 116.

Pelidnota punctata: a brief description and particulars of the economy of this sp. are given, with figures, in i. Rep. Ins. Ont. p. 106.

Cotalpa: Horn, Tr. Am. Ent. Soc. 1871, pp. 337 & 338, pl. iii., tabulates the American spp., figuring details of *C. ursina*, Horn, *granicollis*, Hald., and *lanigera*, L.

Rhinkhyptia plana, sp. n., Walker, List Col. Lord, p. 12; Arabia.

Phyllopertha asiatica, p. 343, and *variabilis*, p. 344, Russia in Asia, Ballion, l. c. xliii.; *P. oberthuri*, Fairmaire, l. c. p. 379, Constantine: spp. nn.

Anomala subluccida, p. 344, Turkestan, *dubia* [preoccupied], *ibid.*, *subaurata*, p. 345, Amoor: Ballion, l. c. spp. nn.

Popilia bogdanowi, sp. n., *id.* l. c. p. 345, Amoor.

Plusiotus marginatus, sp. n., C. O. Waterhouse, Ent. M. M. viii. p. 5, Chiriqui.

Cotalpa consobrina, sp. n., Horn, l. c. p. 337, pl. iii. f. 30, Arizona.

Repsimus purpureipes, sp. n., Macleay, l. c. p. 197, Gayndah (?=*æneus*, var., *sec. auct.*).

Adoretus pruinosis, Ballion, l. c., Turkestan; *A. senescens*, Walker, l. c., Tadjura: spp. nn.

Dynastides.

Xyloryctes tuberosus, Hbst., is to stand for *jamaicensis*, F., *nec* Drury; *X. satyrus*, F., = *jamaicensis*, Drury: Harold, C. H. vii. p. 117. *Pentodon monodon*, F., = *idiota*, Hbst., which stands; *Oronotus dædalus*, F., = *diadema*, Ol., = *xanthus*, Ol., = *hircus*, F., which stands; *Dynastes oculatus*, Scop., Gronov., = *hercules*, L., ♀; *Megasoma typhon*, Ol., = *gyas*, Jabl., which stands: *id.* l. c. viii. p. 121.

Cyclocephala. Horn, l. c. pp. 334-337, pl. iii., tabulates the American spp., figuring the ant. tibia in males of *C. puberula*, Lec., *nigricollis*, Burm., *seditionosa*, Lec., and *immaculata*, Ol.

Dynastes granti. Under this name, Horn (l. c. 1870, p. 78) describes a var. from Arizona of *D. tityus*, L.

Anodon, g. n., Fairmaire, Ann. Soc. Ent. Fr. (5) i. p. 36. Form of *Bothynus* and *Isodon*, but allied to *Heteronychus* and *Podalgus*; stridulating organs covering all the propygidium; prosternal projection strongly pointed and slightly arched behind; apical joint of max. palpi very large, pyriform, truncate. *A. coquereli*, sp. n., *id.* l. c. p. 37, Madagascar.

Cyclocephala elegans, sp. n., Horn, l. c. 1871, p. 337, pl. iii. f. 4, L. California and Indian Territory.

Heteronychus rugifrons, sp. n., Fairmaire l. c. p. 36, Madagascar, Zanzibar.

Heteronychus picipes, p. 198, and *irregularis*, p. 199, Gayndah: Macleay, l. c., spp. nn.

Pentodon dubius, p. 345, *affinis* and *humilis*, p. 346, Turkestan: Ballion, Bull. Mosc. xliii., spp. nn.

Isodon puncticollis, p. 197, *laevicollis*, p. 198, Gayndah: Macleay, l. c., spp. nn.

Dasygnathus mastersi, sp. n., *id.* l. c. p. 199, Gayndah.

Oryctes sinaica [sic], Walker, List Col. Lord, p. 13, Mt. Sinai; *obscurus*, Macleay, l. c. p. 200, Gayndah: spp. nn.

Semanopterus depressiusculus, p. 200, *convexusculus*, p. 201, Gayndah: *id.* l. c., spp. nn.

Cryptodus subcostatus, *obscurus*, p. 201, *incornutus*, p. 202, Gayndah: *id.* l. c., spp. nn.

Rhizoplatys ambiguus, sp. n., Gerstäcker, Arch. f. Nat. xxxvii. p. 46, Zanzibar.

Cetoniides.

MOHNIKE (Arch. f. Nat. xxvii. pp. 224–320, Sep.-abdr., pp. 96, pls. v., vi., vii.) revises the spp. from the Sunda Isles and Moluccas, characterizing 2 genera and 22 species as new.

According to him, *Rhomborrhina* is probably not represented in the Asian archipelago, except at Japan; *Heterorrhina* is not to be retained; *Diceros florensis* and *malayanus*, Wall., are entitled to specific rank, but *D. peteli*, Buq., and *ornatus*, Hope, are probably local vars. of one sp.; *D. miratus*, Wall., = *dives*, ♀; *Heterorrhina confusa*, Westw., Wall., = *Coryphocera bimacula*, Wied., *certe*; *Clinteria dives*, Voll., = *flavonotata*, Hope; *C. cinctipennis*, Chev., is a good sp.; *C. biguttata*, G. & P., and *flavomarginata*, Wied., are not vars. of *atra*, Wied., but the former = *6-pustulata*, G. & P., var.; *C. vidua*, Voll., and *C. malayensis*, Wall., = *flavomarginata*, Wied., vars.; *Agestrata gagates* and *withilli*, Hope, = *orichalcea*, L.; *A. orichalcea*, Lac., Wall., Gem. & H., = *dehaani*, Dup., with which *parrii*, Wall., is probably identical; *Lomaptera castanea*, Leyd. Mus., = *timoriensis*, Wall., immat.; *L. cupripes* and *nigroaenea*, Wat., *nitens*, Blanch., *viridicenea*, G. & P., = *pulla*, Bilb., of which *agni*, Wall., is a var.; *L. valida*, Chev., Burm., = *virens*, Homb. & Jacq.; *L. inermis*, Wall., probably = *xanthopus*, Boisd., var.; *Clerota* (*Macronota*) *vittigera*, Hope, probably = *budda*, G. & P., var.; *Chalcothea resplendens*, Wall., = *affinis*, Voll.; *Macronota variegata*, Wall., = *cineracea*, G. & P.; *M. aurantiaca*, Voll., = *picta*, Guér.; *Schizorrhina emiliae*, Thoms., *arouana* and *borouensis*, Wall., = *Hemipharis whitii*, Thoms.; *S. idæ*, White, = *Eupcecila flamula*, Blanch.; *S. sanguinolenta*, Voll., = *Sternoplus schaumii*, White; *Glycyphana* (*Euryomia*) *regalis* and *forsteni*, Voll., are, as Wallace surmises, not specifically distinct, *sec. typ.*; *G. tenera*, Wall., ? = *malayensis*, Guér., var.; *G. plagiata* and *behrri*, Schaum, are vars. of a species named *variabilis*, p. 72; *Protetia 4-adspersa*, G. & P., = *prolongata*, G. & P., var.; *Cetonia fictilis* and *querula*, Newm., = *Protetia mandarinea*, Web.; *P. marmorea*, Web., is specifically distinct from *acuminata*, F., with which *corrosa*, G. & P., is identical; *G. porcina*, Wall., ? = *ciliata*, Ol., var. The author figures, T. v., *Diceros peteli*, Buq., ♂, f. 3, *Clinteria flavomarginata*, Wied., and var. figs. 5 & 6;

T. vii., *Glycyphana plagiata*, Schm., f. 2, *G. behri*, Schm., f. 3, *G. variabilis*, Mohn., f. 4.

REICHE, Ann. Soc. Ent. Fr. (5) i. pp. 82 & 83, reviews the nomenclature of certain European spp. According to him, *Epicometis tonsa*, Burm., = *Tropi[do]nota* [*Tropidonotus* in *Reptilia*] *hirtella*, L., abraded; *Cetonia femorata*, Ill., having the anterior tibiæ bidentate, cannot be included in *Epicometis*, Burm., in which those members are stated to be tridentate, and a new generic division (or subdivision) is proposed for its reception, under the name *Paleira*; *C. feralis*, Fr., in like manner, and for the same reason, cannot be referred to *Æthiessa*, Burm., and a new division, *Brachytricha*, is suggested for it; *C. viridiflua*, Mots., = *squamosa*, G. & P., = *refulgens*, Hbst., but the latter cannot be referred to *floricola*, F., as Schaum has opined; *C. tincta*, Germ., is an *Æthiessa*, next after *refulgens*; *C. songorica* and *fasciata*, Fisch., = *purpurea*, Burm., *sec. exempl.* from Mannerheim; *C. jousselini*, G. & P., and *C. speciosa*, Adams, cannot be admitted as varr. of *æruginea*, Drury (*fastuosa*, F.).

Epicometis hirtella and *Orythyrea stictica*. Künstler (Verh. z.-b. Wien, xxi. Beih. pp. 25 & 26) discusses injuries to cultivated plants from these spp.

Cetonia metallica, according to Nowicki (*ibid.* p. 8, note), is injurious to corn-plants. Vars. from Samarcand of *C. afflicta*, Gory, and *sibirica*, Gebl., are recorded by Solsky, Hor. Ent. Ross. viii. p. 146.

Cremastochilus. Horn, l. c. 1871, pp. 339-341, pl. iii., tabulates the American spp., figuring details of *planatus*, *schaumi*, and *nitens*, Lec. He notes that the cupule of the mentum becomes more acute at its hinder angle, and, as a rule, less deep in its concavity, as the spp. occur near the Pacific; and, remarking on the connexion of certain spp. with ants, suggests that the fossæ at the anterior angles and the finely punctured and apparently perforated patches under the posterior angles are glandular, and yield some secretion.

Trichius fortunatorum, Blanch. Wollaston (Tr. E. Soc. 1871, p. 257) considers the reference of this or any other *Trichius* to Teneriffe to be most probably erroneous.

New genera and species :—

Prigenia, Mohnike, l. c. p. 228 (*Goliathides*). Between *Narycius* and *Cyphonocephalus*. *P. vollenhoveni*, id. l. c. p. 231, T. v. f. 1, ♂, 2, ♀, Java.

Cholerastoma, id. l. c. p. 315 (*Cremastochilides*). Tarsi 4-jointed; basal joint of antennæ enormously enlarged, like a triangle with rounded angles; between *Cyclidius* and *Cremastochilus*, but, from the structure of its clypeus, ligula, &c., widely differing from all the *Cetoniidæ*. *C. spondylidea*, id. l. c. p. 318, T. vii. f. 8, Java.

Coryphocera imperatrix, id. l. c. p. 238, T. v. f. 4, ♀, Java.

Clinteria viridissima, id. l. c. p. 250, T. v. f. 7, Java.

Agestrata augusta, id. l. c. p. 254, Celebes.

Lomaptera doreica, p. 261, New Guinea; *ulricæ*, p. 263, T. vi. f. 1, ♀, and *anomala*, p. 265, f. 2, ♀, Gilolo: id. l. c.

Eupæcila balteata, Vollenhoven, in Mohnike's revision, p. 277, T. vi. f. 3, Waigiou.

Glycyphana palliata, p. 279, T. vi. f. 4, *picta*, p. 283, T. v. f. 8, *albomaculata*, p. 287, T. vi. f. 6, *pygmæa*, p. 293, Java; *puella*, p. 281, f. 6, Bourou; *inusta*, p. 282, *flavopunctata*, p. 290, T. vii. f. 1, Borneo: Mohnike, l. c.

Prolatia ternatana, p. 300, Ternate; *acutissima*, p. 306, T. vii. f. 5, *lyrata*, p. 308, f. 6, Java; *pectoralis*, p. 309, Celebes: *id. l. c.*

Macroma triguttulata, p. 311, *gloriosa*, p. 313, T. vii. f. 7, Sumatra: *id. l. c.*

Allorhina hueti, Chevrolat, Ann. Ent. Belg. xiv. p. 6, pl. 1. f. 1, Guatemala (bred in Paris).

Schizorhina mastersi, p. 202, *hirticeps*, *nigrans*, *pulchra*, p. 203, *viridicuprea*, p. 204, Gayndah: Macleay, Tr. Ent. Soc. N. S. W. ii.

Tropi[do]nota lethierryi, Reiche, *l. c.* p. 85, Algeria.

Cetonia marginicollis (redescribed and figured by Solsky, Hor. Ent. Ross. viii. p. 142, T. v. f. 2), p. 346, *conspersa*, *æmula*, *interruptocostata*, p. 347, *magnifica*, p. 348, Russia: Ballion, Bull. Mosc. xliii. *C. doriae*, Teheran and Damascus, *athalia* (= *subpilosa*, des L.: des Loges, *ibid.* Bull. p. lxxv), Syria and Anatolia, p. 86; *judith*, p. 87, Syria and ? Algeria: Reiche, *l. c.* *C. longula*, des Loges, Mitth. Schw. ent. Ges. iii. p. 358, Sarepta.

Pachnoda euparypha, Gerstäcker, Arch. f. Nat. xxxvii. p. 46, Zanzibar and Mozambique.

Cremastochilus depressus, p. 340, *pilosicollis*, p. 341, California: Horn, *l. c.*

Osmoderma socialis, *id. l. c.* p. 338, America.

Trichius novi, Pellet, Mém. Soc. Ac. Pyr. Or. 1871, Canigou [intermediate between *fasciatus* and *zonatus*: cf. Nouv. et faits, p. lxxxix and Pet. Nouv. p. 164].

Valgus nigrinus and *castaneipennis*, Macleay, *l. c.* p. 205; *V. californicus*, Horn, *l. c.* 1870, p. 78, California.

BUPRESTIDÆ.

E. SAUNDERS has published (London, Sept. 1871, pp. 171), under the title 'Catalogus Buprestidarum synonymicus et systematicus,' a list of all the known spp. of this family, with synonymy, bibliographical references, and localities, on the scheme of Gemminger and von Harold's 'Catalogus,' and mainly adopting Lacordaire's arrangement. This work (conscientiously and ably executed), in addition to such alterations in published names as have occurred to its author in the investigation of the subject (and, with other synonymic references, necessarily too numerous for abstraction), contains the following proposed changes in nomenclature (in addition to others made without reference to place of publication, but recorded in Zool. Rec. vii. pp. 285 & 286):—

Julodis flavohirta for *hirsuta*, Lap. & G., nec Hbst.; *J. lucasi* for *cicatricosa*, Luc., nec Germ.; *J. marseuli* for *pilosa*, Lap. & G., nec F.; *J. stevensi* for *setosa*, Stev., nec Thunb.; *Cyphogastra javanica* for *ventricosa*, Lap. & G., nec Ol.; *Halecia obscura* for *modesta*, Lap. & G., nec F.; *Psiloptera aurata* for *aurifera*, Lap. & G., nec Ol. & c.; *P. obscurata* for *argenteosparsa*, Lap. & G., nec Perty; *P. cæruleitarsis* for *variolora*, Lap. & G., nec Payk.; *P. fairmairii* for *oculicollis*, Fairm., nec Lap. & G.; *Buprestis lecontii* for *rusticorum*, Gory, nec Kirby; *Melobasis gorii* for *cuprifera*, Lap. & G., nec Kirby; *Melanophila chevrolati* for *inflammata*, Chevr., nec Lap. & G.; *Anthaxia similis* for *morio*, Hbst., nec Payk.; *Polycesta gorii* for *depressa*, Lap. & G., nec L.; *Conognatha*

impressipennis for the author's *brevicollis*, nec Kirsch; *C. militaris* for *miles*, Lap. & G., pl. nec text; *Stigmodera fusca* for *parrii*, Hope, nec nascio, id.; *S. bella* for *cruentata*, Lap. & G., nec Kirby; *S. binotata* for the author's *bimaculata*, Ins. Saund., nec Journ. Linn. Soc.; *S. haroldi* for *viridiventrtris*, Saund., nec MacL.; *Nothomorpha spinolæ* for *stictica*, Spin., nec Chev.; *Acmæodera gorii* for *gracilis*, Lap. & G., nec Wied.; *A. incana* for 18-guttata, Lap. & G., nec Pill.; *Sphenoptera marseuli* for *pallasia*, Mars., nec Schön.; *S. mannerheimi* for *laticollis*, Mann., nec Ol.; *S. laportii* for *metallica*, Lap. & G., nec F.; *S. dubia* for *exarata*, Lap. & G., nec Fisch.; *Chrysobothris fabricii* for *impressa*, Lap. & G., nec Ol.; *Coræbus laportii* for *spinosus*, Lap. & G., nec F.; *Melibæus mouhoti* for *aurifasciatus*, Saund., nec Hope; *Agrilus gorii* for *mucronatus*, Lap. & G., nec Klug; *A. blanchardi* for *ater*, Blanch., nec L.; *A. dorbignii* for *spinosus*, Blanch., nec F.; *A. lecontei* for *subfasciatus*, Lec., nec Gory; *A. fahræi* for *acutipennis*, Fähr., nec Mann.; *A. murrayi* for *ignicollis*, Murr., nec Deyr.; *Paragrillus* for *Clinocera*, Deyr., preoccupied; *P. dubius* for *exiguus*, Lap. & G., nec Chev.; *Liis cayennensis* for *exigua*, Lap. & G., nec F.; *Pachyscelus erichsoni* for *lucidulus*, Er., nec F.

The following apparently uncharacterized genera (chiefly from H. Deyrolle's MS.) are employed:—*Amblysterna*, p. 2, type *natalensis*, Fähr.; *Chrysaspis*, p. 10, type *elongata*, Ol.; *Prospheres*, p. 11, type *aurantiopicta*, Lap. & G.; *Chalcophoropsis*, p. 12, type 4-foveolata, Lap. & G.; *Lamprochila*, p. 15, type *maillii*, Lap. & G. *Hilarotes*, type *mannerheimi*, Mann.; *Scaptelytra*, type *sulphureovittata*, Fähr.; *Lachesis*, type *abyla*, Gory, p. 21; *Icaria*, p. 30, type *alata*, L. & G.; *Chalcopœcia*, p. 31, type *ornata*, Gory; *Chalcophia*, p. 34, type *lateralis*, Ol.; *Pasiphae*, p. 35, type *modesta*, F.; *Briseis*, p. 44, type *comica*, L. & G.; *Paraphrixia*, p. 46, type *purpurea*, Ol.; *Aglaostola*, p. 47, type *tereticollis*, Pall.; *Merimna*, type *atrata*, L. & G.; *Agæocera*, type *gigas*, L. & G.; *Aristosoma*, type *suturalis*, Thunb., *Chalcogenia*, type *sulcipennis*, Gory, p. 50; *Anilara*, type *semireticulata*, Chev.; *Neocuris*, type *guerini*, Hope, *Curis*, type *peroni*, L. & G., p. 57; *Julodimorpha*, p. 65, type *bakewelli*, White; *Ocypetes*, p. 77, type *guttulata*, Fairm.; *Xyrosceles*, type *crocata*, L. & G., *Nothomorpha*, type *verrucosa*, L. & G., p. 78; *Entomogaster*, p. 102, type 6-punctata, L. & G.; *Amyia*, p. 111, type *violacea*, L. & G.

Chrysobothris femorata, "the Buprestis Apple-tree Borer." Particulars of economy &c., i. Rep. Ins. Ont. p. 71.

Genecerus, g. n., Walker, List Col. Lord, p. 13. Allied to *Plastocerus*. *G. cervinus*, sp. n., id. l. c. p. 14, Hor Tamanib.

Julodis kauffmanni, sp. n., Ballion, Bull. Mosc. xliii. p. 348, Turkestan.

Chrysochroa lordi, sp. n., Walker, l. c. p. 13, Harkeko.

Steraspis fastuosa, sp. n., Gerstäcker, Arch. f. Nat. xxxvii. p. 452, Kiriama.

Capmodis metallica [script. *melattica*], *parumstriata*, *sezmaculata*, Turkestan: Ballion, l. c. p. 349, spp. nn.

Melanophila legrandi, sp. n., Mulsant & Pellet, Ann. Soc. L. Lyon, xviii. p. 201 (Op. Ent. xiv. p. 229), Algeria.

Anthaxia apollonii, p. 349, Turkestan, *auriventrtris*, p. 350, Kapal: Ballion, l. c., spp. nn.

Acmæodera [script. *Acmacedera*], *dubia*, id. *ibid.*, Mogol-Tau mountains; *A. quadrivittata*, Horn, Tr. Am. Ent. Soc. 1870, p. 79, Utah: spp. nn.

Sphenoptera quadraticollis, Gerstäcker, *l. c.* p. 53, Mombas; *S. purpurifera*, Walker, *l. c.* p. 13, Wady Ferran : spp. nn.

Chrysobothris empyrea, sp. n., Gerstäcker, *l. c.*, Zanzibar.

Coræbus cyaneus, sp. n., Ballion, *l. c.* Turkestan.

Aphanisticus nodosus, sp. n., Gerstäcker, *l. c.*, Mombas.

Trachys quercicola, sp. n., de Marseul, Ann. Soc. Ent. Fr. (5) i. p. 80, Savoy.

THROSCIDÆ.

Throscus. Kraatz, B. E. Z. xv. pp. 141 & 142, tabulates the German spp.

Throscus carinifrons, Bonv., is characterized, and recorded as British, by Rye, Ent. M. M. viii. p. 135; also subsequently by Janson.

EUCNEMIDÆ.

DE BONVOULOIR, Ann. Soc. Ent. Fr. (4) x., suppl. (dated 1870, published in 1871), has at length been enabled to give to the entomological world the 1st portion of his monograph, consisting of 288 pages and 21 plates, the execution (and especially the engraving) of which is almost beyond praise. After bibliographical and general notices, the author maintains the value of the *Eucnemidæ* as a family equivalent to the *Throscidæ* and *Buprestidæ*, including *Cer[at]ophytum* in it, but admitting that a 4th family is needed for the reception of the single genus *Perothops*. He incorporates with his work a history by Perris of the metamorphoses of *Farsus unicolor*, Latr., *Eucnemis capucinus*, Ahr., and *Xylobius humeralis*, Duf. (pp. 30–58, pl. 1. figs. 1–16, pl. 2. figs. 1–3*b*); the larva of the first of which appears to possess two forms at different ages, suggestive of the hypermetamorphosis of the *Meloides*; of the second differs much from that of *Melasis* or *Farsus*, but strongly resembles that of *Fornax*; and of the third is closely allied to *Eucnemis*. Details of the larva &c. of *Melasis buprestoides* are also given (pl. 1. figs. 17–19).

The author figures many details of structure of the imago in different genera on pls. 2 & 3, and figures, in addition to such as he describes as new, the following species:—*Cer[at]ophytum elateroides*, Latr., *Melasis buprestoides*, L., *pectinicornis*, Melsh., and *rufipalpis*, Chevr., *Tharops melasoides*, Cast., *nigriceps*, Mann. (pl. 4), *obliqua* and *ruficornis*, Say, *Gastraulacus bisulcatus*, Latr., *Temnillus lepreuri*, Guér., *Arisus wicardi* and *orientalis*, Cast. (5), *Eucnemis capucina*, Ahr., *Stethon pectorosus*, Lec. (6), *Deltometopus amënicornis*, Say, ♂ & ♀, and *foveolatus*, Guér., ♂ & ♀ (7), *Dromæolus barnabita*, Villa, *ampeloides*, Mots. (8), *cylindricollis*, Say (11), and *chevrolati*, Guér. (12), *Fornax concolor*, Blanch. (13), *fulvus*, Mots. (14), *badius*, Melsh. (15), *nietneri*, Redt., *umbrinus*, Mots. (17), *grandis* and *madagascariensis*, Cast., *orchesides*, Lec. (18), *obtus*, Guér. (19), *luridus*, Chevr., *calceatus*, Say, *tumidicollis*, Redt. (20), *sanguineosignatus* and *opifex*, Guér., and *ruficollis*, Cast. (21), and *Eucalosomus versicolor*, Cast. (17). *Eucnemis quadricollis*, Say, placed in *Melasis* by Lacordaire, belongs to the *Elateridæ*, and forms the genus *Bladus* of Leconte. *Dromæolus cylindricollis*, Boh., nec Say, is renamed *bohemani*. *Gastraulacus atratus*, Guér., = *bisulcatus*, Latr.

The following new genera and spp. are described by him:—

Potergus, p. 110. Somewhat intermediate between *Tharops* and *Gastraulacus*, having the elongate narrow form of the former, and metathoracic and abdominal furrows for reception of the tarsi as in the latter. *P. filiformis*, p. 111, Dorey, N. Guinea.

Diomus, p. 118. Indicates *Gastraulacus* by its cylindrical form, and approaches *Euryostus* in its abbreviated metasternal furrow. *D. singularis*, p. 119, pl. 25. f. 6, Brazil.

Lamprotrichus, p. 120. Differs from *Galbodemus* in its little metasternal furrow, uniting certain characters of *Euryostus* and *Arisus*, and affording a passage to *Diomus*; also with facies of *Dendrocharis*, but with tarsi non-lamellate, &c. *L. (Galbodemus) fasciatus*, Blanch.

Euryostus, p. 123 (no differential characters given). *E. reichii*, sp. n., p. 124, pl. 5. f. 6, Java, Malayan peninsula, Singapore; *hypocrita*, p. 125, Malacca; *inopinatus*, p. 126, Singapore.

Arisus, p. 127. Differs from *Euryostus* in the plane outer surface of its mandibles, its head being either non-carinated or very slightly so, the sharp post. angles of its thorax, and the distinct emargination of the upper apex of the fourth joint of its tarsi. *A. carinulatus*, p. 129, and *adjunctus*, p. 130, Java and Sarawak; *castelnaui*, p. 132, Malayan peninsula; *wicardi* and *orientalis*, Cast. (*Galba*); *depressus*, p. 136, Melbourne.

Idiotarsus, p. 137. Distinguished from the two preceding genera by the structure of its antennæ and tarsi, its prosternal sutures forming a distinct sunken line, &c. *I. vestitus*, p. 139, pl. 5. f. 9, S. Paulo; *sulcicollis*, p. 140, and *muticus*, p. 142, R. Janeiro; *concretus*, p. 141, pl. 6. f. 1, Brazil; *tricarinatus*, p. 143, *ib.* f. 2, Cayenne and Brazil.

Pacilochrus, p. 148. Facies of *Stethon*, from which the structure of its metasternum and tarsi removes it, and really more allied to *Eucnemis*, which it does not resemble. *P. vittatus*, p. 150, pl. 6. f. 3, Ega; *grossicollis*, p. 151, Madagascar; *piceus* and *exiguus*, pp. 152 & 153, Sarawak.

Arganus, p. 158. No prosternal suture. *A. distinctus*, p. 159, Ceram and Mysol.

Thambus, p. 160. Somewhat like *Eucnemis* and *Dromæolus*, but with the metasternal furrow wanting on the outer side of the coxæ, and the triangle of the propleuræ much shorter; pronotum laterally hollowed. *T. agilis*, p. 162, pl. 6. f. 6, *inexpectus*, p. 163, *ib.* f. 7, and *pusillus*, p. 165, *ib.* f. 8, Cordova (Mexico); *frivaldszkii*, p. 166, *ib.* f. 9, Slavonia; *deyrollii*, p. 168, pl. 7. f. 1, Brazil; *diversus*, p. 169, *ib.* f. 2, Petropolis, U. S. A.

Deltometopus, p. 171. Slightly resembling *Microrhagus* in facies and structure of antennæ. *D. fallax*, p. 174, *similis*, p. 178, and *indocilis*, p. 188, Brazil; *stali*, p. 175, R. Janeiro; *fuscipes*, p. 177, pl. 7. f. 3, Colombia and Caraccas; *alacer*, p. 180, *ib.* f. 6, St. Catharine's; *constrictus*, p. 184, Brazil, R. Janeiro; *eruptus*, p. 185, Louisiana; *fulvicornis* and *foveolatus*, Guér., and *amænicornis*, Say, of which *clypeatus*, Lec., is the ♀ (*Eucn.*).

Diacerus, p. 189. Distinct from *Deltometopus* in its much narrower and not posteriorly enlarged antennal furrow, and by the very small and subequal 2nd and 3rd joints of its antennæ. *D. antennatus*, p. 190, pl. 8. f. 1, and *griescens*, p. 191, *ib.* f. 2, Mexico.

Phanerochræus, p. 275. No differential characters given. *P. dimidiatipennis*, p. 276, pl. 12. f. 8, Ega.

Anabolus, p. 277. Propleural triangle with its outer side more than twice as long as the posterior border. *A. mirus*, p. 278, New Holland.

Entomosatopus, p. 279. Distinct from *Anabolus* by its serrate antennæ and the form of its marginal furrow. *E. curtus*, *ibid.*, Benguela.

Diæretus, p. 281. Marginal furrow of propectus very distinctly separated from outer margin of pronotum by a slightly elevated, narrow, punctured space. *D. parallelocollis*, p. 282, pl. 12. f. 9, Ega.

Bermillus, p. 283. Of incrassate build, with short antennæ in ♂, of which intermed. joints are very short and very wide, thick legs, with very wide tarsi, &c. *B. dispar*, p. 284, Malacca.

Phænocerus, p. 285. Antennæ with short interm. joints, the 3 apical being almost clavate; 4th joint of tarsi simple. *P. subclavatus*, p. 286, pl. 13. f. 1, Tasmania.

Lacus, p. 287. Antennæ rather short, especially wide in the middle, and slightly attenuated at the apex; tarsi with penult. joint excavato-emarginate above, basal joint of posterior almost as long as all the rest together; post. border of propleural triangle distinctly longer than the inner side. *L. laticornis*, p. 288, pl. 13. f. 2.

Cer[at]ophytum fuscicorne, p. 84, pl. 4. f. 3, Mexico, Carthage; *cayennense*, p. 86, pl. 4. f. 2, Cayenne.

Tharops marmottani, p. 99, Fontainebleau; *obscuricornis*, p. 100, pl. 4. f. 8, Constantia, U. S. A.; *picteti*, p. 102, New Friburg; *nubila*, p. 108, pl. 5. f. 3, N. America (*rufipes*, Dej. Cat. nec Melsh.).

Dromæolus fuliginosus, p. 205, pl. 8. f. 4, Cayenne; *murinus*, p. 206, Bogota; *dilutipes*, p. 207, Mexico; *ferruginipes*, p. 208, pl. 9. f. 7, Waigiou; *dignoscendus*, p. 210, Melbourne; *punctipennis*, p. 212, pl. 8. f. 6, Ternate; *congener*, p. 213, *ib.* f. 7, Sarawak; *tibialis*, p. 215, *ib.* f. 8, Arou; *litigiosus*, p. 216, Brazil; *bellus*, p. 217, *ib.* f. 9, ♂, Ega; *insignis*, p. 219, pl. 9. f. 1, Para, Brazil; *sallei*, p. 220, *ib.* f. 2, Mexico; *variegatus*, p. 222, *ib.* f. 3, Ega; *tristis*, p. 223, *ib.* f. 4, Izabal; *cinerascens*, p. 224, *ib.* f. 5, Teapa; *ignotus*, p. 225, R. Janeiro; *fastidiosus*, p. 226, *ib.* f. 6, ♀, pl. 10. f. 1, ♂, Brazil, Cayenne; *opacus*, p. 228, pl. 9. f. 8, Tondano, Celebes; *amicus*, p. 229, *ib.* f. 9, Ceraam; *indicus*, p. 230, pl. 10. f. 2, Singapore; *australasie*, p. 231, *ib.* f. 3, Moreton Bay and New Zealand; *angustus*, p. 233, *ib.* f. 4, Sarawak; *prædieri*, p. 234, Gaboon; *modestus*, p. 236, *ib.* f. 5, St. Catherine's; *funcki*, p. 237, *ib.* f. 6, Cumana; *semigriseus*, p. 238, *ib.* f. 7, Singapore, Dorey, Mysol; *frater*, p. 240, *ib.* f. 8, Santarem; *propinquus*, p. 241, Benguela; *lugubris*, p. 243, *ib.* f. 9, Victoria; *elongatus*, p. 244, pl. 11. f. 1, New Granada, Cayenne; *maronita*, p. 246, Taurus; *exilis*, p. 247, *ib.* f. 2, Sumatra; *brevicornis*, p. 249, *ib.* f. 3, Sarawak; *javeti*, p. 252, *ib.* f. 5, Brazil, R. Janeiro; *exul*, p. 255, *ib.* f. 7, locality unknown; *batesi*, p. 257, *ib.* f. 8, Ega; *transfuga*, p. 260, *ib.* f. 9, Brazil, St. Paulo; *foraxoides* [*sic*], p. 263, pl. 12. f. 1, Sumatra; *schaumi*, p. 264, *ib.* f. 2, Brazil; *sejunctus*, p. 266, *ib.* f. 3, and *mar-seuli*, p. 268, *ib.* f. 4, Cananduiga; *salsus*, p. 267, and *novitius*, p. 270, Louisiana; *ambiguus*, p. 271, *ib.* f. 6, New Granada; *crassicornis*, p. 273, *ib.* f. 5, Singapore.

Anelastes drurii, Kby., a N. American sp., is recorded in Nouv. et faits, page c, as taken on three different occasions in Corsica, but under circumstances that prove its importation.

Xylobius cylindriciformis, sp. n., Horn, Tr. Am. Ent. Soc. 1871, p. 341, California.

ELATERIDÆ.

HORN (*l. c.* pp. 299-324, pl. iv.) has published "Descriptions of new species of *Elateridæ* of the United States," figuring *Elater cordifer*, Lec., f. 6, *Megapenthes stigmiosus*, Lec., f. 10, and var. *caprella*, Lec., f. 11, *Limoniæ mirus*, Lec., f. 15, *maculicollis*, Mots., f. 17, *Corymbites trapezium*, Lec., f. 18, *umbripennis*, Lec., f. 19, *triundulatus*, Rand., f. 20, *hamatus*, Say, f. 22, *appressus*, Rand., f. 23, *Oxygonus obesus*, Say, f. 24, with some spp. nn. The description of pl. iii., relating to *Aphodius*, appears to be misplaced in this paper. Discrepancy between figure and description of *Meristhus scobinula*, Cand., is pointed out; *Limoniæ consimilis*, Walker, = *infuscatus*, Mots., which is not *occidentalis*, Cand.; *L. discicollis*, Cand., = *maculicollis*, Mots.; *L. humeralis*, Cand., = *ornatus*, Lec.; *Corymbites nebraskensis*, Bland, = *triundulatus*, Rand.; *C. diversicolor*, Esch., = *rotundicollis*, Say; a var. of *C. morulus*, Lec., is described; *C. carbo*, Lec., = *lateralis*, Lec.; and a var. of *C. cruciatus*, L., is described under the name *edwardsi*.

Agrypnus notodonta, Latr., is recorded from Cairo by Baudi, B. E. Z. xv. p. 49, note.

Tylotarsus boieldieui, Cand., = *cuspidatus*, Klug; *cinctipes*, Germ., must be used for *cuspidatus*, Cand.: Fairmaire, Ann. Soc. Ent. Fr. (5) i. p. 40.

Heteroderes puncticollis, Woll., = *Anchastus atlanticus*, Cand.: Wollaston, Ann. N. H. (4) vi. p. 401.

Drasterius bimaculatus, F., and *figuratus*, Germ., *Elater megerlii*, Lac., *Cryptohypnus alysidotus*, Kies., *Cardiophorus dilutus* and *crassicollis*, Er., *Melanotus rufipes*, ? Hbst., *M. dichrous*, Er.: varieties from Cyprus of these species are recorded by Baudi, *l. c.* p. 51 *et seq.*

Elater coccinatus, Rye, is recorded from Fontainebleau, in oak, by Bedel, Ann. Soc. Ent. Fr. (5) i. Bull. p. lxiii.

Elater costeri, Weyenberg. The author (S. E. Z. xxxii. p. 270) introduces a novelty in nomenclature by changing his reasons for giving this specific name, and not altering the name itself. His original Coster turns out an impostor, the invention of printing being once more attributed to Gutenberg; consequently this Solenhofen fossil is to be understood as glorifying another Coster, a medical man of the 17th century.

Athous sylvaticus. Des Loges, Mitth. schw. ent. Ges. iii. p. 371, describes a var. from Vernet, under the name *lævigatus*.

Cratonychus africanus, Boh., = *umbilicatus*, Schön.: Gerstäcker, Arch. f. Nat. xxxvii. p. 54.

Cardiophorus nigropunctatus, Cand., = *Melanoxanthus id.*, Mots., *ex typ.*: de Marseul, Nouv. et faits, p. xcvi. *C. deflexus*, Schaaf.: Schaufuss, Nunq. Ot. i. p. 193, repeats his opinion that this is *melampus*, Ill. *C. nigricornis*, Baudi, = *æratius*, Er.; *incanus*, Er. (*inflatus*, Gené, MS.), should be placed between *asperulus*, Cand., and *rubripes*, Germ.: Baudi, *l. c.* pp. 52 & 53 (note).

Pyrophorus punctatissimus, Bl. Burmeister (P. L. S. xi. p. 416 *et seq.*) refers to this sp. the luminous larva mentioned by Murray and Trimen, and named *Astraptor illuminator* by the former. He fully describes and figures this with details.

Agriotes lineatus, Brk. Künstler (Verh. z.-b. Wien, xxi. Beih. p. 4) discusses injuries caused to cultivated plants by this sp.

Agriotes sordidus, Ill., is recorded as British by Sharp: Ent. M. M. viii. p. 83.

Agriotes brevisculus, des L., is to be suppressed, being founded on an abnormal individual [Zool. Rec. vii. p. 287]; *A. meridionalis*, des L., = *laicharlingi*, Gredl.: des Loges, l. c. p. 375.

Agriotes corsicus, Cand., is recorded from Cyprus, Piedmont, and various Italian districts: Baudi, l. c. p. 55.

Elatrinus, g. n., Horn, l. c. p. 307. Allied to *Elastrus*, but antennæ strongly serrate, 1st point moderate, 2nd very short, broader than long, 3-10 broadly triangular, 11th longer, but without false joint. *E. anthrax*, sp. n., *id. ibid.*, California.

New species :—

Agrypnus maculicollis, Gerstäcker, l. c. p. 53, Zanzibar.

Lacon jansonii, Fairmaire, Ann. Soc. Ent. Fr. (5) i. p. 40, Madagascar; *L. pygmaeus*, Baudi, l. c. p. 49, Cyprus (? = *ovalis*, Germ., var. minor, sec. auct.).

Tylotarsus squalescens, Fairmaire, l. c. p. 39, Madagascar.

Elastrus submurinus, p. 38, *ampedoides*, p. 39, Madagascar: *id. l. c.*

Alaus atropos, Gerstäcker, l. c., See Jipe, Zanzibar.

Ischiodontus pedestris, *id. l. c.* p. 54, Zanzibar.

Anchastus desertus, California, *sericeus*, Arizona, Horn, l. c. p. 311.

Monocrepidius advena, Gerstäcker, l. c., Aruscha; *M. robustus*, p. 311, *mutuus*, p. 312, Arizona, Horn, l. c.

Athous cyprius, Baudi, l. c. p. 54, Cyprus; *A. corticeus*, Fairmaire, l. c. (4) x. p. 380, Algeria; *A. brevicornis*, p. 369, Corsica, *oblongicollis*, Maritime Alps, *rubrotestaceus*, Andalusia, p. 370, *obtusifrons*, p. 371, Basses Alpes, des Loges, Mitth. schw. ent. Ges. iii.; *A. axillaris*, p. 316, California, *flavangularis*, p. 317, Vermont, Horn, l. c.

Limoniæ quadrimaculatus, p. 313, *ulkii* and *cribricollis*, p. 314, California, *nitidulus*, S. Oregon, p. 315: Horn, l. c.

Melanotus cuneiformis, Baudi, l. c. p. 53, Cyprus.

Elatér pulcher, *id. l. c.* p. 51, Cyprus; *E. atripennis*, *behrensi*, f. 5, *cordatus*, f. 7, California, Horn, l. c. p. 306.

Megapenthes coquereli, Fairmaire, l. c. (5) i. p. 41, Madagascar; *M. aterrimus*, California, New Mexico, p. 309, *elegans*, California, f. 12, *rogersi*, f. 7, p. 310, Ontario: Horn, l. c.

Melanoxanthus lateplagiatus, Fairmaire, l. c., Zanzibar.

Heteroderes acutangulus, Gerstäcker, l. c. p. 54, Mbaramu, Zanzibar.

Cryptohypnus sanborni, p. 303, New Hampshire, *æstivus*, Missouri, *perplexus*, f. 4, Pennsylvania, p. 304, *dubius*, Nebraska, Dakota, *colon*, California, p. 305: Horn, l. c.

Drasterius grandicollis, f. 8, California, *marginicollis*, Oregon: *id. l. c.* p. 308.

Cardiotarsus griseus, Fairmaire, l. c. p. 40, Madagascar.

Tetrigus cyprius, Baudi, l. c. p. 50, Cyprus.

Meristhus cristatus, p. 299, pl. iv. f. 2, L. California, *texanus*, p. 300, f. 1, Texas: Horn, l. c.

Cardiophorus fuscovittatus, Fairmaire, l. c. p. 42, Madagascar; *C. obsoletus*,

Gerstäcker, *l. c.*, Endara; *C. togatus*, Texas, *edwardsi* and *æneus*, California, Horn, *l. c.* p. 301.

Horistonotus definitus, California, *uhleri*, Florida, Maryland: *id. l. c.* p. 302.

Coptostethus (?) *americanus*, *id. l. c.* p. 303, f. 3, Louisiana.

Ludius penicillatus, Gerstäcker, *l. c.*, Mbaramu; *L. lecontei*, Horn, *l. c.* 1871, p. 313, California.

Oxygonus ater, *id. l. c.* p. 318, California.

Corymbites longicornis, *id. l. c.* 1870, p. 79, N. Carolina; *xanthomus* and *monticola*, California, *copii*, S. Virginia, p. 319, *limoniiformis*, Dacota, *pruininus*, Nebraska, p. 320, *breweri*, California, *præses*, Montana, p. 321, *obversus*, p. 322, California, *id. l. c.* 1871.

Agriotes hispanicus, des Loges, *l. c.* p. 369, Algeciras; *A. italicus*, Baudi, *l. c.* p. 55, note, Piedmont (= *sordidus*, Ill., var. *teste* Kiesenwetter, *ibid.*); *A. protractus*, Horn, *l. c.* 1871, p. 317, California.

CEBRIONIDÆ.

Cebrio spurcaticollis, p. 380, Barbary; *dubitabilis*, p. 381, *grandipennis*, p. 383, Algeria; *falsicolor*, p. 381, Bone; *crassus*, p. 382 (no locality): Fairmaire, *l. c.* (4) x.: spp. un.

RHIPI[DO]CERIDÆ.

Polymerius, g. n., Philippi, S. E. Z. xxxii. p. 293, taf. 3. f. 8-8 c. Distinct from *Rhipi[do]cera* and *Sandalus* by wanting tarsal lamellæ, and from *Calirhipis*, *Zenóa*, and *Sandalia* by its antennæ being 18-jointed. *P. marmoratus*, sp. n., *id. ibid.*, Oertchen Colina, Santiago (in *Trevoa quinquenervia*).

DASCILLIDÆ.

BAUDI (B. E. Z. xv. pp. 89-92) records the result of his examination of the exponents in Dejean's collection at Turin of the European and circum-Mediterranean spp. of this family contained in the 3rd edition of that author's catalogue. He redescribes *Helodes flavicollis*, Kies., and refers to varieties of certain spp., one of which he dubiously (*l. c.* p. 92, note) describes, from Piedmont, as *Scirtes attenuatus*, and which is (*ibid.*) referred by Kiesenwetter to *S. hemisphæricus*.

Helodes: Kiesenwetter, *ibid.* p. 87, tabulates the European spp.

Helodes tourmeri, sp. n., *id. l. c.* p. 88, Sardinia.

Cyphon impressus, sp. n., *id. l. c.* p. 75, Sardinia.

Hydrocyphon pallidicollis, sp. n. (diagn. only), Raffray, Pet. nouv. p. 160, Algeria.

TELEPHORIDÆ.

V. KIESENWETTER (*l. c.* pp. 75-86) reviews the Malacoderm fauna of Corsica, Sardinia, and Sicily, publishing the diagnoses of many new spp., of which the descriptions are to appear in Hft. xxix. of Küster's Käf. Europ.

BAUDI (*ibid.* pp. 92-130) records the result of his examination of Dejean's exponents of the European members of this family, in continuation of his similar treatment of the *Dascillidæ*. In the notes he redescribes some already known spp., characterizes others as new, refers to varieties, &c. It is useless to extract here his rectifications of synonymy in mere catalogue names.

Lycides.

Lycus cuspidatus, Klug, = *constrictus*, Boh., ♂ : Gerstäcker, Arch. f. Nat. xxxvii. p. 55.

Eros aurora. Baudi (*l. c.* p. 92) notes the occurrence of this sp. in N. America, Carolina and Georgia.

Eros affinis. Hardy has reared this sp. from larvæ taken 5 years previously : Ent. M. M. vii. p. 207.

Lycus congener, p. 55, *gravidulus*, p. 56, Zanzibar : Gerstäcker, *l. c.*, spp. nn.

Eros favosus, *id. l. c.* p. 56, Endara, Zanzibar ; *E. erythropterus*, Baudi, *l. c.* p. 93, S. Russia : spp. nn.

Homalitus taurinensis, sp. n., *id. l. c.* p. 93, note, Piedmont.

Tilmanus fuscus, sp. n., *id. l. c.* p. 97, note, Sardinia.

Lampyrides.

Lampyris noctiluca. Jousset, C. R. lxxiii. p. 629, records his observations on the phosphorescence of the eggs of this sp.

Lampyris berytensis, Fairm. Baudi, *l. c.* p. 57, describes Syrian examples, referred with doubt to this sp.

Lampyris amplicollis and *vidua*, Gerstäcker, *l. c.* p. 55, Zanzibar ; *L. syriaca*, Baudi, *l. c.* p. 58, Syria : spp. nn.

Lampyrhiza foliacea, sp. n., *id. l. c.* p. 99, Sardinia.

Luciola linearis and *leta*, spp. nn., Gerstäcker, *l. c.*, Zanzibar.

Drilides.

BAUDI (*l. c.* p. 63) notes that the 4th joint of the tarsi in this group seems cordiform and bilobed from above, but from below is simple, being provided with a pellicle that is entire at the apex.

Malacogaster, Bassi. Lucas, Ann. Soc. Ent. Fr. (5) i. p. 19 *et seq.*, describes the apterous ♀ of a member of this genus, hitherto only recognized by its ♂ characters. He remarks (p. 28, note) upon the curious fact of the ♂ being small and yet so supplied with spermatozoa as to be able to fecundate the enormous number of ova contained in the ♀. [It has been recorded that 2 ♂ of *Drilus flavescens* were found in copulâ with one and the same ♀ : cf. Zool. Rec. v. p. 250.]

Drilus fulvitaris, sp. n., Baudi, *l. c.* p. 120, S. Russia, Caucasus.

Malacogaster bassii, Lucas, *l. c.* pp. 23-28, ♂, pl. 1. f. 3, ♀, *id. f.* 4, Oran, in *Helix dupotetiana*, *lucasi*, *zapharina*, and *jourdainiana* [cf. Zool. Rec. vii. p. 290] ; *M. truquii*, p. 61, *rufipes*, p. 62, Cyprus, Baudi, *l. c.* : spp. nn.

Telephorides.

Telephorus vittaticollis, Reiche, and *præcox*, Géné. Belon confirms de Marseul's opinion as to the identity of these supposed species : Nouv. et faits, p. lxxxv.

Telephorus figuratus, Mann. Baudi, *l. c.* p. 112, note, describes a Swedish and Piedmontese var. under the name *decipiens*, which Kiesenwetter, *ibid.*, considers to be a good species.

Rhagonycha fuscicornis, Ol., var. n. *nubila*, Italy ; *R. meisteri*, Gredl., var. n. *pedemontana* : Baudi, *l. c.* pp. 110 & 113, notes.

Podabrus obscuripes, sp. n., J. Sahlberg, Not. Fenn. xi. p. 435, Lapland.

Telephorus biplagiatus, p. 351, Kapal, *submarginalis* and *raptor*, *ibid.*, *tenue-limbatus*, p. 352, Turkestan, Ballion, Bull. Mosc. xliii.; *T. versicolor*, p. 102, note, S. Italy, *unguiculatus*, p. 104, Spain, *edentulus*, p. 106, S. Russia, Baudi, l. c.; *T. (Cantharis) angularis*, J. Sahlberg, l. c. p. 363, Carelia: spp. nn.

Rhagonycha vicina, sp. n., Baudi, l. c. p. 109, S. Russia.

Malthinides.

Malthinus syriacus, Mars., = *rubricollis*, Baudi (*ex descr.*), which also occurs at Cyprus: *id. l. c.* p. 60.

Malthodes berytensis, Reiche, occurs in Cyprus, and should be placed between *prodigiosus* and *siculus*, Kies.: *id. ibid.*

Malthodes trifurcatus, Kies., var. n. *penninus*, Alps: *id. l. c.* p. 119, note.

Malthinus armipes, Sardinia, *sordidus*, Tuscany, *læsus*, Algeria, p. 76, *sicanus*, p. 77, Sicily (= *dryocates* [sic], Rott.: Rottenberg, *ibid.* p. 247): Kiesenwetter, *ibid.*, spp. nn.

Malthodes raymondi, p. 77, *ensifer*, p. 80, Sardinia; *tenax* and *mendax*, p. 77, *corsicus*, p. 79, *insularis*, p. 80, Corsica; *spectabilis*, Middle Italy, *umbrosus*, Tuscany, Naples, *parthenias*, Naples, p. 78; *pinnatus*, p. 79, Sicily, Naples, Tuscany; *hastulifer*, *ibid.*, *ruralis*, p. 80, Sicily; *tetracanthus*, p. 79, Görz, Tuscany; *picticollis*, p. 80, no locality: *id. ibid.* *M. setifer*, p. 117, note, and *M. (script. Malthinus) recurvus*, p. 118, note, Maritime Alps: Baudi, l. c., spp. nn.

Malachiides.

Collops. Horn (Tr. Am. Ent. Soc. 1870, pp. 79-84) tabulates the American spp., describing and figuring the articulated appendage of the antennæ of ♂, apparently of use during copulation.

Malachius carnifex, Er., *ornatus*, Fald., *Anthocomus equestris*, F., *Colotes flavocinctus*, Mars.: Baudi, l. c. p. 63 *et seq.*, records Syrian and Cyprian vars. of these species. *Malachius faldermanni*, Dej. (*dimidiatus*, Fald.) = *ornatus*, Fald., ♀; *armeniacus*, Fald., = *geniculatus*, Germ., var.; *australis*, L., = *lusitanicus*, Er., var.; a Sardinian and Sicilian var. of *affinis*, Mén., is described, and named *muticus*; and varr. of other species are referred to: *id. l. c.* p. 121 *et seq.* *M. bicornis*, Costa, is dubiously suggested to be allied to *Troglops silo*, Er.: *id. l. c.* p. 130, note.

Anthocomus and *Attalus*. Horn, l. c. p. 85, notes the confusion in the interpretation of these genera by authors, especially as regards American species. If Duval be right, *Acletus*, Lec., = *Ebæus*.

Anthocomus (in error, *Anthonomus*) *vesiculiger*, Mars., is apparently referable to *Hypebæus*: Baudi, l. c. p. 68.

Attalus transfuga, Kies., var. n. *palliatu*s, Sardinia: *id. l. c.* p. 127, note.

Ebæus collaris, Er., var. n. *flavifrons*, Sardinia: *id. l. c.* p. 126, note.

Charopus saginatus, Kies., = *trogloidytes*, Gené; *furcatipennis*, Villa, = *concolor*, F., ♂, *ex typ.*: *id. l. c.* p. 129, note.

Antidipnis maculatus, Kies., = *Ebæus trimaculatus*, Gebl.: Solsky, Hor. ent. Ross. viii. p. 166.

Troglops corsicus, Perris, ? = *silo*, Er., ♀: des Loges, Mitth. schw. ent. Ges. iii. p. 375.

Trophimus, g. n., Horn, l. c. p. 84. Allied to *Troglops* and *Homæodipnis*,

but with last joint of max. palpi longer than 2nd, and gradually attenuate; also allied to *Cephalagonia*, Woll.; ant. tarsi in ♂ 4-jointed. *T. æneipennis*, sp. n., *id. l. c.* p. 85, Colorado and New Mexico.

Hapalochrus flavicollis, sp. n., Schaufuss, Nunq. Ot. i. p. 157, Tauria.

Collops validus, p. 82, Sonora, *pulchellus*, Arizona, and *laticollis*, L. California, p. 83: Horn, *l. c.*, spp. nn.

Malachius fallaciosus and *cyprius*, p. 64, Cyprus, *assimilis* (? Er. *ined.*), p. 65, Caucasus, Syria, Cyprus, Baudi, *l. c.*; *M. brevispina*, Kiesenwetter, *ibid.* p. 81, Sardinia; *M. serricornis*, Ballion, Bull. Mosc. xliii. p. 352, Turkestan; *M. (Hapalorhinus) biguttulus*, Horn, *l. c.* p. 87, California: spp. nn.

Axinotarsus raguseæ, sp. n., Schaufuss, *l. c.*, Palermo.

Anthocomus crassicornis, sp. n., Baudi, *l. c.* p. 67, Syria.

Attalus panormitanus, Ragusa, Bull. ent. Ital. iii. p. 282, Sicily (= *Axinotarsus raguseæ*, Schauf., *sec. auct.*); *A. nigripes*, p. 85, Colorado, *elegans*, p. 86, California, Horn, *l. c.*: spp. nn.

Ebeus tricolor, sp. n., Ballion, *l. c.* p. 353, Turkestan.

Hypebæus ? *cyanipennis*, p. 68, Syria, *mylabrinus*, p. 69, Cyprus, Beyrouth: Baudi, *l. c.*, spp. nn.

Charopus aterrimus, Allard, L'Ab. v. p. 467, Oran [omit. Zool. Rec. v.]; *C. varipes*, Baudi, *l. c.* p. 128, note, Liguria, M. Italy: spp. nn.

Colotes anthicinus, sp. n., Baudi, *l. c.* p. 70, Cyprus, Beyrouth.

Dasytides.

Dasytes communimacula, Costa, is a good species, not to be sunk as a var. of *4-pustulatus*, F.: Kiesenwetter, *l. c.* p. 82.

Dasytes oculatus, Kies. Rye (Ent. M. M. vii. p. 206) gives additional characters and British localities.

Amauronia. Ancey records the capture at Ste. Baume of an apparently new species of this genus, not before signalized as French: Nouv. et faits, p. lxxxii.

Dasytes occiduus, Mulsant & Rey, Ann. Soc. L. Lyon, xviii. p. 96 (Op. Ent. xiv. p. 120), La Rochelle; *D. grenieri*, Kiesenwetter, *l. c.* p. 83, Corsica: spp. nn.

Dasytiscus pexus, p. 85, Sicily (= *medius*, Rott.: Rottenberg, *ibid.* p. 247), *obesus*, *ibid.*, note, *beckeri* and *squamatus*, p. 86, note, Algeria: *id. l. c.*, spp. nn.

Haplcnemus xanthopus, sp. n., *id. l. c.* p. 85, Corsica.

Danacæa corsica[na], Corsica, and *sardoa*, Sardinia: *id. l. c.* p. 86, spp. nn.

Melyris nobilis and *parvula*, Gerstäcker, Arch. f. Nat. xxxvii. p. 56, Zanzibar, spp. nn.

Prionocerus hirtus, Walker, List Col. Lord, p. 14, Tajura; *P. dimidiatus* and *P. (Idgia) apicalis*, Gerstäcker, *l. c.*, Zanzibar: spp. nn.

CLERIDÆ.

Necrobia rufipes occurs at Zanzibar and Wanga: *id. l. c.* p. 57.

Phlæocopus vinctus, sp. n., *id. ibid.*, See Jipe, Zanzibar.

Clerus lepidus, Tajura, and *illepidus*, Cairo, Walker, List Col. Lord, p. 14; *C. (Thanasimus) repandus*, Horn, *l. c.* 1871, p. 342, North California, Sonora: spp. nn.

Hydnocera albocincta, sp. n., *id. ibid.*, Texas.

Chariessa elegans, sp. n., *id. l. c.* 1870, p. 87, California.

Corynetes rugipennis, sp. n., Ballion, Bull. Mosc. xliii. p. 353, Turkestan.

LYMEXYLIDÆ.

Lymexylon navale. Berce (Pet. Nouv. p. 136) notes the method of oviposition of ♀ of this species, found by him in quantity at Fontainebleau.

Lymexylon abbreviatum, F., = *Atractocerus necydaloides*, Palis., = *madagascariensis*, Lap., = *africanus*, Boh., = *frontalis*, Klug., = *brevicornis*, Linn.: Gerstaecker, *l. c.* p. 57.

PTINIDÆ.

MULSANT & REY, in Ann. Soc. Agric. Lyon, (4) i. pp. 179–406, pls. i.–xiv., monograph the European members of their “Tribu des Gibbicolles;” after their accustomed elaborate method. The work is entered in the index (there being no title) as by Mulsant alone (“Tribu des Gibbicolles, pour faire suite à l’histoire des Coléoptères de France”); but the new genera and species have the names of Mulsant & Rey appended.

They restrict *Hedobia* to *pubescens*, F., and dismember *Ptinus* into the following subgenera:—*Eutaphrus*, p. 233, *Gynopterus*, p. 248, *Heterophus*, p. 276, *Ptinus* proper, p. 281, *Cyphoderes*, p. 351. Pl. i. contains an (excellent) outline of *Hedobia pubescens*; pl. ii., *Ptinomorphus imperialis*; pl. iii., *Eutaphrus loboderus* and *nitidus*; pl. iv., *Gynopterus germanus*; pl. v., *Heterophus pusillus*; pl. vi., *Ptinus italicus*, ♂ and ♀; pls. vii. & viii., portions of *Ptinus* proper; pl. ix., *P. perplexus*; pl. x., *Cyphoderes bidens*, ♂ and ♀; pl. xi., *Eurostus submetallicus*; pl. xii., *Niptus hololeucus* and *Epaulæcus crenatus*; pl. xiii., *Tipnus exiguus* and *Mezium affine*; pl. xiv., *Gibbium scotias*: in all cases accompanied by detail.

DESMAREST, Ann. Soc. Ent. Fr. (4) x. Bull. p. xciv, records an unknown *Ptinus* as destroying an herbarium.

Ptinus subpilosus, Müll., is recorded as British by Sharp, Ent. M. M. viii. p. 83.

Xylétinus sericeus, Moraw., = *ornatus*, Germ., var.; *Ptinus ruber*, Rosenh., = *cisti*, Chevr., = *spitzii*, Villa: de Marseul, Nouv. et faits, p. lxxxii.

Dorca [*do*] *toma*. Kraatz, B. E. Z. xv. pp. 146–148, gives comparative characters &c. for *serra*, *punctulata*, and *D. (Enneatoma) subglobosa*, Muls.

Ptinomorphus, g. n., Mulsant & Rey, *l. c.* p. 209. Characters apparently superficial. *P. (Hedobia) imperialis*, auct., *regalis*, Duft., *angustatus*, Bris.

Eurostus, g. n., *id. l. c.* p. 363. *E. (P.) submetallicus*, Fairm.; *frigidus*, Boield.

Epaulæcus, g. n., *id. l. c.* p. 376. *E. (P.) crenatus*, F.

Ptinus perplexus, *id. l. c.* p. 338, pl. ix. f. 1, Provence; *P. affinis*, p. 341, Sicily, *insularis*, p. 342, Corsica?, Malta, *brevicrinatus*, p. 359, Corsica: des Loges, Mitth. schw. ent. Ges. iii.: spp. nn.

Anobium nitidulum, sp. n., Wollaston, Tr. E. Soc. 1871, p. 262, Madeira.

Ernobius microtomus, sp. n., J. Sahlberg, Not. Fenn. xi. p. 431, Lapland.

Dorca [*do*] *toma pubescens*, sp. n., Schaufuss, Nung. Ot. i. p. 159, Peru.

BOSTRYCHIDÆ.

Apate capucina. Ancey (Nouv. et faits, p. lxxxii) records its coupling.

Xylopertha sericea, Muls., = *crinitarsis*, Imh. : Gerstäcker, Arch. f. Nat. xxxvii. p. 57.

Apate dispar, *anceps*, p. 663, *frontalis*, *femoralis*, p. 664, *bicolor*, p. 665, Caffraria : Fåhræus, Öfv. Vet. Ak. xxviii., spp. nn.

Sinoxylon ruficorne, sp. n., *id. l. c.* p. 665, Caffraria.

Xylopertha castaneipennis, *plagiata*, p. 666, *adusta*, *pusilla*, *sellata*, p. 667, Caffraria, *id. l. c.* ; *X. foveicollis*, Allard, L'Ab. v. p. 468, Sicily [omit. Zool. Rec. v.] ; *X. barbifrons*, Walker, List Col. Lord, p. 14, Arabia : spp. nn.

Bostrychus cylindricus, p. 668, *tristis*, *picipennis*, p. 669, *fascicularis*, p. 670, Caffraria : Fåhræus, *l. c.*, spp. nn.

CICIDÆ.

Cis elongatulus, Gyll., is recorded as British : Sharp, *l. c.*

Xylographus perforatus, Gerstäcker, *l. c.* p. 57, Zanzibar ; *X. tarsalis*, Fåhræus, *l. c.* p. 670, Caffraria : spp. nn.

Cis caffer, p. 670, *testaceus*, *afæ*, p. 671, Caffraria ; *id. l. c.*, spp. nn.

TENEBRIONIDÆ.

HORN (Tr. Am. Phil. Soc. xiv. n. s. pt. ii. 1870, pp. 253-404, pls. xiv. & xv.) publishes a "Revision of the Tenebrionidæ of America, north of Mexico," which he thus defines :—"Prosternum attaining the hind margin of the thorax; epimera never contiguous on the median line. Anterior coxal cavities closed behind. Tarsi heteromerous, penultimate joint never spongy beneath. Tarsal claws simple. First three joints of the abdomen connate. Elytra with distinct epipleuræ." *Cossyphus* is to constitute a separate family, at the head of Leconte's *Rhynchophora*, and *Boros*, *Pytho*, and allies are rejected from the group. The author considers genera have been needlessly multiplied by recent European entomologists, and especially condemns the whole of Walker's Oregon species, as already described. The *Tenebrionidæ* are divided into 3 subfamilies, *Tentyriidæ*, *Asididæ*, and *Tenebrionidæ* proper :—the *TENTYRIIDÆ* being composed of the following tribes—*Epiphisini*, *Gnathosiini*, *Epitragini*, *Cnemodini*, *Thinobatiini*, *Batuliini*, *Zopherini*, *Usechini*, *Stenosiini*, and *Dacoderini* ; the *ASIDIDÆ* of the *Anepsiini*, *Nyctoporini*, *Cryptoglossini*, *Asidini*, *Branchini*, and *Coniontini* ; the *TENEBRIONIDÆ* corresponding with Coh. ii. of Sect. 2 of Lacordaire, with the addition of Tribe xvi. pt., xvii., xx., xxiv. pt., xxv.—xxvii. of Coh. i. The author is of opinion that a careful revision of non-North American tribes, on the basis of his own division into 3 subfamilies, would result in the union of several of the former ; but it seems at least equally probable that his own arrangement, confined to a comparatively local fauna, may be founded on erroneous, because insufficient, grounds. Copious synoptical tables are given ; and

the lithographed plates contain portions of figures of nearly 70 species.

FÄHRÆUS (Öfv. Vet. Ak. xxvii. pp. 243–317) describes *Tenebrionidæ* from Caffraria, collected by Wahlberg, in continuation of Boheman's 'Insecta Caffrariæ,' and including many new genera and species.

HAAG-RUTENBERG (C. H. vii. pp. 21–111, st. 2; viii. pp. 29–114, st. 3) continues his "Beiträge zur Familie der Tenebrioniden," completing his notice of certain of the *Epitragides*, and commencing a revision of the *Molurides*.

Zophosides.

Zophosis sculptilis and *congesta*, p. 57, *alternata* and *funerea*, p. 58, Gerstäcker, Arch. f. Nat. xxxvii., Zanzibar; *Z. fugax* and *mæsta*, p. 244, *atra* and *anceps*, p. 245, *gracilis*, p. 246, Fähræus, l. c., Caffraria : spp. nn.

Erodiides.

Erodius granipennis, sp. n., Fairmaire, Ann. Soc. Ent. Fr. (4) x. p. 384, Morocco.

Arthrodeis glomeratus, sp. n., *id. ibid.*, Morocco.

Diodontes areolatus, sp. n., Gerstäcker, l. c. p. 58, Endara.

Adesmiides.

Adesmia convergens, p. 14, Heliopolis, *conscia*, p. 15, Cairo, Walker, List Col. Lord; *A. buccata*, Gerstäcker, l. c., Zanzibar; *A. inæqualis*, p. 247, Fähræus, l. c., Caffraria : spp. nn.

Tentyriides.

Dichomma glabra, Brul., = *maillii*, Sol.; *Tentyria subcostata* and *T. elongata*, Ktz., are to be referred to Solier : de Marseul, Nouv. et faits, p. lxxxiii.

Lacordaire's alar character is useless, both apterous and winged species occurring in *Eurymetopon* and *Emmenastus*: Horn, l. c. p. 267.

Emmenastus, Motsch. (of which the type, *sec. Mann.*, is *Blapstinus pulverulentus*, and another species, *E. rugosus*, from Motschoulsky himself, in Leconte's coll., is *Coniontis subpubescens*) is retained, and its species are tabulated with characters : *id. l. c.* pp. 268 & 269.

Stibia, g. n., *id. l. c.* p. 260. Allied to *Triorophus*; mandibles not toothed above. *S. puncticollis*, sp. n., *id. ibid.* pl. xiv. f. 2, 2a, California.

Thalpobia, g. n., Fairmaire, l. c. p. 385. Facies of *Dichomma*, but more allied to *Tentyria*, from which it differs in its elliptic-ovate form, short transverse thorax, with posterior margin slightly arched and closely applied to elytra, &c. *T. lævipennis*, sp. n., *id. l. c.* p. 386, Morocco.

Triorophus subpubescens, sp. n., Horn, l. c. p. 259, N. America.

Tentyria sublegans, sp. n., Fairmaire, l. c., Mogador.

R[h]yti[do]nota oppressa, Walker, l. c. p. 15, Harkeko; *R. stupida* and *ventricosa*, p. 58, *gravidula* and *gracilis*, p. 59, Gerstäcker, l. c., Zanzibar : spp. nn.

Micipsa gastonis, sp. n., Fairmaire, l. c. p. 387, S. Algeria.

Emmenastus subopacus, p. 269, Arizona, *acutus*, p. 270, Nebraska : Horn, l. c., spp. nn.

Eurymetopon bicolor and *sodalis*, *id. l. c.* p. 268, California, spp. nn.

Trimyctis pulverea, Camp Grant, Arizona, *abnormis*, Nevada : *id. l. c.* p. 261, spp. nn.

Epitragides.

Epitragus pruinusosus, California, Arizona, p. 264, *dentiger*, p. 265, Arizona : *id. l. c.*, spp. nn.

Himatismus trivialis, Gerstäcker, l. c. p. 63, Wanga, Zanzibar ; *H. sublinearis*, Walker, l. c. p. 15, Arabia ; *H. kraatzii*, p. 21, *asperifrons*, p. 22, *raucus*, p. 23, C. G. Hope, Haag, C. II. vii. ; *H. plebeius*, Fähræus, l. c. p. 248, Caffraria (? = *patruelis*, Dej., var., *sec. auct.*) : spp. nn.

" *Cnemodini.*"

Horn, l. c. p. 266, founds under this name a fourth "tribe" of his *Tentyridæ*, differing chiefly from the *Epitragides* in having the anterior tibiæ with the outer apical angle prolonged, and with a single spur, and composed of *Cnemodus*, g. n., *ibid.*, the unique species of which, *testaceus*, *ibid.* pl. xiv. f. 10-10b, from Fort Yuma, California, resembles, and is possibly allied to, *Hypselys*, Sol., and has legs resembling those of *Macroductylus* or *Dichelonycha* (*Lamellic.*).

Zopherides.

Zopherus haldemani, Sallé, MS., is adopted for *nodulosus*, Hald. (*nec* Sol.) : *id. l. c.* p. 271, note.

Phla[odes] (*Nosoderma*) *obcordata*, K. Pascoe (Pet. Nouv. p. 132) mentions a Siberian species very close to, if not identical with this, hitherto supposed to be confined to N. America.

Exeniotis, g. n., *id. Ann. N. II.* (4) viii. p. 353. Allied to *Rhyppasma*. *E. collaris*, sp. n., *id. l. c.* p. 354, pl. xiv. f. 7, St. Paulo, Amazons.

Rhyppasma querulum, p. 352, *nanum*, p. 353, *id. l. c.*, Ega, spp. nn.

Zopherus elegans, sp. n., Horn, l. c. p. 272, note [? California].

" *Ancylopomides.*"

Ancylopoma, g. n., Pascoe, l. c. p. 354. To form a new subfamily, allied to the *Zopherides* and *Stenosides*, but with slender and elongate intermediate and posterior tarsi. *A. punctigera*, sp. n., *id. ibid.* pl. xiv. f. 6, Santarem.

Adelostomides.

Eurychora modesta and *pusilla*, Hbst., and *major*, Sol., = *ciliata*, F., varr. : Fähræus, l. c. p. 249.

Aspila, g. n., *id. l. c.* p. 251, belongs to div. *Eurychorides*, Lac. *A. bicostata*, sp. n., *id. ibid.*, Caffraria.

Eurychora ovata, p. 249, *terrestris*, p. 250, *id. l. c.*, Caffraria, spp. nn.

Psuryphis confusa, sp. n., *id. l. c.* p. 252, Caffraria.

Pogonobasis platessa, sp. n., Gerstäcker, l. c. p. 59, See Jipe.

Dacoderides.

Dysmathes sahlbergi, Mann., ? = *Amphizoa insolens*, Lec. : Horn, l. c. p. 276.

Stenosides.

Aræoschizus, Lec. The eyes are divided in this genus : *id.* l. c. p. 274.

Stenosis henoni, sp. n., Allard, L'Ab. v. p. 468, Constantine.

Dichilus crassicornis, sp. n., *id.* l. c. p. 469, Syria [this and preceding species omitted from Zool. Rec. v.].

Tagenia olsecii, sp. n., Fairmaire, Ann. Soc. Ent. Fr. (4) x. p. 388, Tan-giers.

Aræoschizus sulcicollis, p. 274, *armatus*, p. 275, Owens' Valley, California : Horn, l. c., spp. nn.

Scaurides.

Oochila, Lec., is to sink in *Centrioptera*, Mann., with which *Cryptoglossa*, Sol., will hereafter be united : *id.* l. c. p. 278.

Argoporis, g. n., *id.* l. c. p. 325. Differs from *Cerenopus* in having the anterior tibiæ curved, with rounded outer angle. *A. (C.) sulcipennis* and *bicolor*, Lec., and an undescribed Mexican species.

Herpiscius cursor, sp. n., Fähræus, l. c. p. 252, Caffraria.

Cerenopus costulatus, sp. n., Horn, l. c. p. 326, L. California.

Centrioptera asperata, p. 279, L. California, *variolosa*, p. 280, Arizona : *id.* l. c., spp. nn.

Blaptides.

Blaps abbreviata and *confusa*, Mén., *armeniaca*, Fald. (= *teniolata*, Mén., ♂), *confluens*, Fisch., *longicollis*, Stev., *elongata*, Mann., *encifer* [*sic*], Mots., *pruinosa*, Eversm., *Prosodes motschulskii* and *rugosa*, Mots. : for observations on these and their allies, cf. Ballion, Bull. Mosc. xlv. pp. 156-169. *Blaps planicollis*, Mots., *nec* Casteln., if considered existent, requires renaming : *id.* l. c. p. 166.

Blaps carbo, Fisch., = *jageri*, Hum. : de Marseul, Nouv. et faits, p. lxxxiii.

Nycterinus is probably a mere division of *Eleodes*, a polymorphous genus, divided into 3 subgenera :—*Eleodes* proper, with anterior tarsi of both sexes entirely spinous beneath ; *Blapylis*, ant. tarsi of ♂ not dilated ; *Promus*, with at least basal joint dilated. *E. sulcata*, Lec., *preocc.*, is referred to *his-pilabris*, Say ; *impressicollis*, Boh., = *clavicornis*, Esch., *deform.* ; *subaspera*, Lec., *nec* Sol., is named *lecontii* ; *planata* and *scabrosa*, Esch., *producta*, Mann., *constricta*, Lec., = *parvicollis*, Lec. ; *tuberculata*, Esch., *intricata*, Mann., *rotundipennis* and *stricta*, Lec., = *cordata*, Esch. ; *viator* and *subligata*, Lec., = *pime-lioides*, Mann. : Horn, l. c. p. 301 *et seq.*

Eleodes militaris, p. 310, *pilosa*, p. 314, *tenebrosa*, p. 316, *id.* l. c., California and Nevada : spp. nn.

Embaphion elongatum, W. Nevada, *planum*, Kansas, Colorado : *id.* l. c. p. 321, spp. nn.

Asidides.

Pelecyporus, Sol., *Euschides*, Lec., and *Philolithus*, Lac., are to merge in *Asida*, which is to contain all species wherein the trochantin of the middle coxæ is plainly visible, and the 11-jointed antennæ are not received in thoracic grooves: *id. l. c. p. 282*.

Machleida [rectius *Machloida*], g. n., Fähræus, Cefv. Vet. Ak. xxvii. p. 256. Facies of *Machla*, but allied to *Asida*. *M. nodulosa*, sp. n., *id. ibid.*, Caffraria.

Machla hamaticollis, Gerstäcker, *l. c. p. 59*, See Jipe; *M. verrucosa*, p. 253, *caffra* and *sulcicollis*, p. 254, *mendica* and *porcella*, p. 255, Fähræus, *l. c.*, Caffraria: spp. nn.

Asida actiosa, California, *semilevis*, W. Nevada, p. 284, *luctata*, California, p. 286, *captiosa*, R. Tulare (? distinct from *lecontii*, Horn, of which a var. *compressa* is described), *consobrina*, N. America, p. 287, *gibbicollis*, L. California, p. 288, Horn, *l. c.*; *A. bicostata* and *trivialis*, Fähræus, *l. c. p. 257*, Caffraria: spp. nn.

Astrotus regularis, sp. n., Horn, *l. c. p. 290*, Texas.

Pimeliides.

Oenera pilicollis, Fald., is an error for *pilicornis*: Ballion, *l. c. p. 169*.

Pimelia ornata, Mill., = *comata*, Sol.: de Marseul, Nouv. et faits, p. lxxxiii.

Pimelia mogadora, sp. n., Fairmaire, Ann. Soc. Ent. Fr. (4) x. p. 387, Mogador (? = *fornicata*, Hbst., var., *sec. auct.*).

Molyrides.

HAAG-RUTENBERG (C. H. vii. pp. 24-111, viii. pp. 29-113) commences a revision of this group with which he associates *Phrynocolus*, Lac. (*Cryptogenius*, Sol.), and *Phligna*, Cast. (*Cyrtoderes*, Sol.). According to him (vii.), *Oncosoma granulare*, Westw., = *gemmatum*, F.; *Phligna curculionides*, *sinuosa*, *nigrita*, Sol., *degeeri*, Cast., *lacunosa*, Thunb., = *cristata*, Deg.; *Pimelia bi-striata*, Hbst., = *Molyris gibba*, Pall.; *gibba*, Hbst., *nec* Pall., is named *herbsti* (p. 54); *Mol. hirtipes*, Cast., = *Psammodes reichii*, Sol.; *striatus*, F., is to be retained for the later *Psamm.* (*Pim.*) of the same author, and *striatus*, *unicolor*, *cæ-latus*, *spinolæ*, *hemisphæricus*, and *gravidus*, Sol., are varr. of that sp., of which another var. (f.) is named *nigrocostatus*; *M. luteipes*, Guér., = *Ps. scaber*, F.; a var. of *Ps. brunneus*, Ol., is named *rufocastaneus*; *Ps. ruficornis*, Sol., = *longicornis*, Kby.; *elongata*, Sol., = *Ps. lævigatus*, Ol.; *Ps. bertolonii*, Guér., ♀ (*nec* ♂) is named *guerini*, p. 82; *Hypomelus bicolor*, Sol., *Oxyura psammodioides*, Guér., = *Ps. peronatus*, Germ.; *Ps. sabulosus*, Sol., = *obliquatus*, *id.*

New genera and species:—

Aptila, Fähræus, *l. c. p. 258*. Allied to *Oncosoma*. *A. tuberculata*, *ibid.*, *noxia* and *costata* (♂ of *tuberculata*, *sec. Haag, l. c.*), p. 259, *debilis* (♂ of *noxia*, *sec. Haag, l. c.*), p. 260, *id. l. c.*, Caffraria.

Ametrocera, *id. l. c. p. 260*. *A. turrita* and *aurita* (respectively ♂ & ♀ of one sp., *sec. Haag, l. c.*), *id. l. c. p. 261*, Caffraria.

Ocnodes, *id. l. c. p. 270*. Allied to *Psammodes*. *O. scrobicollis*, *ibid.*, *concinna*, p. 271, *id. l. c.*, Caffraria.

Amiantus, *id. l. c. p. 279*. Allied to *Phrynocolus*. *A. gibbosus* and *rusticus*,

p. 280, *carinatus*, p. 281, *id. l. c.*, Caffraria; *A. picteti*, p. 46, Abyssinia, *browni*, p. 47, *connexus* and *opacus*, p. 49, S. Africa, *haroldi*, p. 47, Mozambique, *bufo*, p. 48, Zanzibar: Haag, *l. c. vii.*

Epairops [rectius *Epærops*], *id. l. c. p. 282.* Allied to *Sepidium*. *E. fragilis*, *id. ibid.*, Caffraria.

Dichtha, Haag, *l. c. vii. p. 39.* Allied to *Phrynocolus* and *Molyris*, but with a triangular produced scutellum, excavated on each side at the apex and smooth in the middle. *D. (P.) inflatus*, Gerst., (*M.*) *cubica*, Guér.

Distretus, *id. l. c. p. 42.* Scutellum irregularly excised at apex, almost dentate; elytra almost flat. *D. (Mol.) amplipennis*, Fähr., *variolosus*, Guér., *fahræi*, sp. n., p. 43, Caffraria, and ? *Molyris discoidea*, Guér.

Oncosoma cordofanum, Cordofan, *guineense*, Guinea: Haag, *l. c. vii. p. 30.*

Molyris amplipennis (type of *Distretus*, *suprà*), p. 262, *pilicornis* (= *variolosus*, Guér., *sec. Haag, l. c.*), p. 263, Fähræus, *l. c.*, Caffraria; *M. nitida*, *chevrolati*, p. 52, *ferrarii*, p. 55, *redtenbacheri*, p. 56, C. of G. Hope, *rustica*, p. 54, ? int. of S. Africa: Haag, *l. c. vii.* *M. gibbicollis* and *tuberculata*, *id. l. c. viii. p. 107*, C. of G. Hope.

Psammodes ventricosa, *ponderosa*, p. 264, *caffra*, p. 265, *deveza*, p. 266, *nitens*, *lucida*, p. 267, *barbata*, p. 268, *tristis*, *lugubris* (= *grandis*, Sol., *ex typ.*, *sec. Haag, l. c.*), p. 269, Fähræus, *l. c.*, Caffraria; *P. egregius*, p. 74, *batesi*, p. 77, *subgranulatus*, p. 78, *timarchoides*, *ferrugineus*, p. 79, *dilutus*, *semipilosus*, p. 80, *villosulus*, p. 81, *semivillosus*, *villosostriatus*, *velutinus*, p. 87, *uniformis*, *tumidipennis*, p. 88, *pilosipennis*, p. 89, *striatopilosus*, p. 90, *nitidicollis*, p. 91, *nitidissimus*, p. 92, *rufonervosus*, *rufofasciatus*, p. 96, *costalis*, p. 97, *scabriusculus*, *rugulosipennis*, p. 98, *ovipennis*, *undulatus*, p. 102, *obliteratus*, *fritschi*, p. 103, *lanuginosus*, *hirtipennis*, p. 105, *comatus*, p. 106, *setipennis*, p. 107, *longipes*, p. 108, *comptus*, p. 109, *spiculatus*, p. 111, Haag, *l. c. vii.*, S. Africa; *P. retrospinosus*, p. 29, *tuberculifer*, *tuberculipennis*, p. 31, *fragilis*, p. 32, *piceus*, p. 33, *volvulus*, p. 34, *connexus*, p. 35, *dohrni*, p. 36, *pilifer*, p. 37, *badeni*, p. 38, *humeralis*, p. 39, *spinosus*, p. 40, *heydeni*, p. 41, *blapsoides* [sic], p. 43, *distinctus*, *tibialis*, p. 44, *segnis*, p. 49, *memnonius*, *caraboides*, p. 50, *vicinus*, p. 51, *tarsalis*, *pustulifer*, p. 52, *granulifer*, *brunnipes*, p. 54, *trachysceloides*, *obsulcatus*, p. 55, *coloratus*, p. 57, *atratus*, p. 60, *splendens*, *difficilis*, p. 61, *protensus*, p. 62, *depressicollis*, p. 67, *rotundicollis*, p. 69, *semiscaber*, p. 76, *herculeanus*, p. 86, *angulicollis*, p. 88, *hirtipennis*, p. 92, *basalis*, p. 93, *interstitialis*, p. 94, *reflexus*, p. 95, *reflexicollis*, p. 97, *gersteckeri*, p. 100, *productus*, *collaris*, p. 101, *kirschi*, p. 102, *carinatus*, p. 103, *thoreyi*, p. 104, S. Africa, nearly all from C. G. Hope; *ovulum*, p. 75, *funestus*, *melancholicus*, p. 79, *setosocostatus*, p. 99, Int. S. Africa; *globosus*, p. 73, ? Int. Africa; *abyssinicus*, p. 32, Abyssinia; *mixtus*, p. 73, *pictus*, p. 80, *molossus*, p. 83, N'Gami; *nervosus*, p. 75, *dimidiatus*, p. 88, Zambesi; *granulosicollis*, p. 77, Damara Land; *luctuosus*, p. 66, Angola or Benguela; *erichsoni*, p. 63, *cordiventris*, p. 71, *tumidus*, p. 72, Benguela; *cordiformis*, p. 77, *sculpturatus*, p. 78, Angola; *javeti*, p. 66, Guinea; *brunnescens*, p. 65, Mozambique, *id. l. c. viii.*

Hypomelus procerus, p. 271, *quadricostatus*, p. 272, *tricostatus*, *tenipes*, p. 273: Fähræus, *l. c.*, Caffraria.

Oxyura punctipennis, *femoralis*, Haag, *l. c. viii. p. 111*, C. of G. Hope.

Trachynotus silphoides, p. 274, *lævis*, *glaber*, p. 275, *maculosus*, p. 276, *angulatus*, *griseus*, p. 277, *terricola*, *funestus*, p. 278, *pygmaeus*, p. 279: Fähræus, *l. c.*, Caffraria.

Phrynocolus niloticus, p. 34, W. Nile, Upp. Egypt, *abyssinicus*, p. 35, Abyssinia: Haag, l. c. viii. *P. petrosus*, *frondosus*, *plicatus*, Gerstäcker, l. c. p. 59, Zanzibar.

Phlygra crucifera, Haag, l. c. vii. p. 35, C. of G. Hope.

Sepidium bicaudatum, Fairmaire, l. c. p. 388, Mogador; *S. muscorum*, Gerstäcker, l. c. p. 60, Endara.

Coniontides.

Eusattus costatus, p. 293, *erosus*, p. 294, Horn, l. c., L. California: spp. nn.

Coniontis robusta and *opaca*, *id.* l. c. p. 296, California: spp. nn.

Crypticus corticeus, p. 389, Tangiers, *nebulosus*, *ibid.*, Algeria, *maculosus*, p. 390, note, Syria, Fairmaire, Ann. Soc. Ent. Fr. (4) x.; *C. subpunctatus*, Walker, List Col. Lord, p. 15 (? Egypt): spp. nn.

Pedinides.

Olocrates paludicola, Chev., = *gibbus*, F.; *Meladeras amœnus*, Muls., = *obscurus*, Muls.; *Helioptathes simularis*, Chev., = *ibericus*, Muls.; *H. cribratus*, Chev., = *cribratostriatus*, Muls.: de Marseul, Nouv. et faits, p. lxxxiii.

Mecysmus, g. n., Horn, l. c. p. 349. Differs from *Blapstinus* in its elongate depressed form and subquadrate thorax, which is narrower at the base than the elytra. *M. (B.) angustus*, Lec.

Ulus, g. n., *id.* l. c. p. 358. *Blapstinus* with ant. tibia more dilated, emarginate at apex, with outer angle prolonged; resembles *Trichoton*. *U. (Bl.) obliquus* and *crassus*, Lec.

Oxythorax, g. n., Fähræus, l. c. p. 288. Allied to *Eurynotus*. Sp. *O. clathratus*, sp. n., *id.* l. c., Caffraria.

Trigonopus lugubris, *wahlbergi*, p. 283, *caffer*, *mœrens*, p. 284, *micans*, *dentipes*, p. 285, *trivialis*, p. 286, *alternans*, p. 287, *id.* l. c., Caffraria: spp. nn.

Melanopterus amaroides, sp. n., *id.* l. c. p. 287, Caffraria.

Eurynotus inops, sp. n., *id.* l. c. p. 289, Caffraria.

[*H*] *Opatrinus sayi*, Horn, l. c. p. 349, Kansas; *H. trivialis* and *elevatus*, Gerstäcker, l. c. p. 60, Zanzibar: spp. nn.

Anchophthalmus clathratus and *scutatus*, *id.* *ibid.*, See Jipe: spp. nn.

Comibius elongatus, sp. n., Horn, l. c. p. 351, California.

Blapstinus auripilis, p. 353, Arizona, *discolor*, p. 354, California: *id.* l. c., spp. nn.

Notibius gagates, sp. n., *id.* l. c. p. 357, California.

Hopatrises.

Gonocephalum terrosum, Kust., *obscurum*, Ol., *hispidum*, Brullé, and *setuligerum*, Costa, are to be referred to [*H*] *Opatrum*; *Sclerum hirsutum*, Mill., = *humerosum*, Mill.: de Marseul, l. c. p. lxxxiii.

[*H*] *Opatrum sabulosum*, L. Lucas, Ann. Soc. Ent. Fr. (5) i. pp. 452-460, pl. 7. figs. 9-17, describes and figures, with details, the larva and pupa of this species. The larva, apart from size, appears to be closely allied to that of *Tenebrio molitor*; and the author remarks that the larva figured and described

Fischer (Oryctographie de Russie), with a query, as that of *Gonocephalum* (*Hopatrum*) *pygmæum*, Kust., does not belong to this genus, or even to the

family. Some notes on *Crustacea* and *Arachnida* in Lucas's paper seem out of place, and liable to be overlooked.

Cyptus, g. n., Gerstäcker, *l. c.* p. 61. *C. scabrosus*, sp. n., *id. ibid.*, Zanzibar.

Alaudes, g. n., Horn, *l. c.* p. 361. Eyeless; intercoxal process of abdomen short, broad, rounded in front; tibiæ triangular; last joint of max. palpi oval. *A. singularis*, sp. n., *id. l. c.* p. 362, pl. xiv. f. 23-23b, California, associated with small black ants under stones.

Zophodes, g. n., Fähræus, *l. c.* p. 298. *Z. tristis*, sp. n., *id. ibid.*, Caffraria.

Ennychius, g. n., *id. l. c.* p. 299. Allied to *Stizopus*, but with no tibial groove or outer median tooth. *E. morio* (? Buquet), sp. n., *id. ibid.*, Caffraria.

Gonopus ater, *deplanatus*, p. 290, *costatus*, p. 291, *agrestis*, *hirtipes*, p. 292: *id. l. c.*, Caffraria, spp. nn.

Anomalipus mastodon, *urus*, p. 293, *A. (Acmaeus) elephas*, p. 294, *A. lemur*, *talpa*, p. 295, *meles*, *mustela*, p. 296, *A. (Apodemus) porcus*, *planus*, p. 297, *id. l. c.*, Caffraria; *A. heraldicus*, Gerstäcker, *l. c.* p. 60, See Jipe: spp. nn.

Cnemidoptera sericea, sp. n., Horn, *l. c.* p. 360, California.

[*H.*] *Opatrum granatum*, Fairmaire, *l. c.* p. 392, Constantine; *H. opacum*, p. 15, and *pubiferum*, p. 16, Cairo, *tomentosum*, *ibid.*, Arabia, Walker, *l. c.*; *H. contractum*, *dermestoides*, and *debile*, Gerstäcker, *l. c.* p. 61, Zanzibar: spp. nn.

Melambius breviusculus, p. 390, Algeria, *aspericostatus*, p. 391, Batna: Fairmaire, *l. c.*, spp. nn.

Phylax ovipennis, p. 391, Constantine, *olcesii*, p. 392, Morocco: *id. l. c.*, spp. nn.

Trachyscelides.

Philhammus [sic], g. n., *id. l. c.* p. 393. Allied to *Anæmia*, but with ant. margin of head scarcely sinuate; antennæ rather longer than head; eyes not visible from above; of much more elongate form, and with no lateral setæ. *P. sericans*, sp. n., *id. ibid.*, Morocco.

Phaleria limbata, p. 375, San Francisco, *humeralis*, p. 377, California, Horn, *l. c.*; *P. munda*, Walker, *l. c.* p. 16, Tôr: spp. nn.

Anæmia californica, Horn, *l. c.* p. 378, California, Nevada; *A.* [script. *Amenia*] *aphodioides*, Walker, *l. c.*, Arabia: spp. nn.

Bolitophagides.

PASCOE, Ann. N. H. (4) viii. p. 351, tabulates the genera of this subfamily, referring to errors in Gemminger & v. Harold's catalogue.

Atastahus, g. n., *id. l. c.* p. 348. Facies of *Bolitotherus cornutus*; last joint of max. palpi long and fusiform. *A. spectrum*, sp. n., *id. ibid.* pl. xiv. f. 3, ♂, Malacca.

Dysantes, g. n., *id. ibid.* *D. (Diceroderes) elongatus*, Redt.; *Dys. taurus*, sp. n., Pascoe, *l. c.* p. 349, Java.

Calymmus, g. n., *id. ibid.* Antennal club triarticulate, Perroud's reference of *Tortecum berardi*, Montr., to this gen. ined. of Dej. Cat. being erroneous. *C. cucullatus*, *id. ibid.* pl. xiv. f. 8, R. Janeiro, *asperulus*, p. 350, Columbia, spp. nn.

Bolitoxenus bifurcus, sp. n., *id. l. c.* p. 350, Penang.

Heledona nasalis, *id. ibid.*, Penang; *H. fungicola*, Horn, *l. c.* p. 389, Middle States: spp. nn.

Diaperides.

Allophasia, g. n., Pascoe, *l. c.* p. 351. Eyes slightly granulated; clypeus cornute and apex of thorax bispinose in ♂. *A. frii*, sp. n., *id. l. c.* p. 352, Brazil.

Stomylus, g. n., Fähræus, *l. c.* p. 300. *S. bicolor*, *ibid.*, *nitidulus*, *gracilis*, p. 301, *id. l. c.*, Caffraria: spp. nn.

Diaperis rufipes, sp. n., Horn, *l. c.* p. 379, Arizona.

Platydemia micans, sp. n., *id. l. c.* p. 383, S. Carolina.

Ceropria westermanni, sp. n., Fähræus, *l. c.* p. 300, Caffraria.

Pentaphyllus californicus, sp. n., Horn, *l. c.* p. 387, California.

Ulomides.

Cataphronetis attenuata, Mots., = *brunnea*, Luc.; *Hypophlæus ratzeburgi*, Wism., = *Tribolium bifoveolatum*, Duft.: de Marseul, *l. c.*

Aniara, Dej., preoccupied in the *Cicindelidæ*, is changed to *Holaniara*, and briefly recharacterized: Fairmaire, Ann. Soc. Ent. Fr. (5) i. p. 43.

Echocerus, g. n., Horn, *l. c.* p. 366. *E. (Gnathocerus) maxillosus*, F.

Merotennus, g. n., *id. l. c.* p. 367. Differs from *Ulosonia* in its more prominent epistoma, non-impressed suture, and non-tuberculate frons. *M. elongatus*, sp. n., *id. ibid.*, California.

Mycetrogus, g. n., *id. ibid.* Prosternum prolonged, mucronate; mesosternum deeply emarginate. Differs from *Erebus*, Muls., in its tuberculate head and convex mentum, of which the middle lobe is rather prominent in front. *M. piceus*, *ibid.*, *angustus*, p. 368, Arizona: spp. nn.

Platyotus, g. n., Gerstäcker, *l. c.* p. 62. *P. glabratus*, sp. n., *id. ibid.*, Zanzibar.

Proselytus, g. n., Fähræus, *l. c.* p. 302. Allied to *Uloma*. *P. caffer*, sp. n., *id. ibid.*, Caffraria.

Metaclisa marginalis, sp. n., Horn, *l. c.* p. 369, N. California and S. Sierras.

Uloma pusilla, Gerstäcker, *l. c.* p. 62, Zanzibar; *U. mentalis*, Horn, *l. c.* p. 371, Texas, Kansas: spp. nn.

Alphitobius opacus, sp. n., Gerstäcker, *l. c.*, Zanzibar.

Holaniara vidua, sp. n., Fairmaire, *l. c.*, Madagascar, Mayotte.

Peltoides capensis, sp. n., Fähræus, *l. c.* p. 303, Caffraria.

Hypophlæus volvulus, sp. n., Gerstäcker, *l. c.*, Zanzibar.

Toxicum grande, sp. n., Pascoe, *l. c.* p. 352, N. Borneo.

Cossyphides.

Cossyp[h]us [*Cossypha* in *Aves*] *dentiventris*, sp. n., Gerstäcker, *l. c.* p. 63, See Jipe.

Eutelides.

Eutehus turpis, sp. n., Fähræus, *l. c.* p. 304, Caffraria.

Cælometopides.

Cælocnemis californica, Mann., = *dilaticollis*, Mann., and varr. of *punctata*, Lec., are described: Horn, *l. c.* p. 336.

Tenebrionides.

Mencophilus loripes, Ill., = *curvipes*, F., ♂; *Tenebrio transversalis*, Duft., = *picipes*, Hbst. : de Marseul, l. c.

Nyctobates sublævis, Beauv., *inermis*, Mann., = *pennsylvanica*, De G.; *intermedia*, Hald., = *barbata*, Knoch : Horn, l. c. p. 333.

A form of *Iphthimus serratus*, Mann., from E. New Mexico, is named *lewisi*; *sublævis* and *serratus* (with which *servilis*, *servator*, and *subligatus*, Walk., are probably identical), Lec., being recognized as other forms of the same species: *id.* l. c. pp. 334 & 335.

Metachisa atra, Lec., is dubiously referred to *Hapladrus*, and probably should constitute a new genus: *id.* l. c. p. 339.

Alephus, g. n., *id.* l. c. p. 346. Head as in *Cerenopus*. *A. pallidus*, sp. n., *id.* *ibid.* pl. xiv. f. 22, California.

Eupsophus, g. n., *id.* l. c. p. 347. Resembles *Himatismus* in outline, but with no affinities with the *Epitragides*; probably constituting, with *Alephus*, a "tribe" near the S.-American *Goniaderides*. *E. castaneus*, sp. n., *id.* *ibid.*, California.

Nyctobates brachialis, sp. n., Gerstäcker, l. c. p. 63, Zanzibar.

Heterotarsides.

Pratæus, Lec., has the penultimate joint of the tarsi as in the other species of this division, though less distinctly bilobed: Horn, l. c. p. 374.

Dichastops, g. n., Gerstäcker, l. c. p. 63. Differs from *Lyprops* in its divided eyes, stouter antennæ, wider prosternal process, and short transverse thorax, which is much narrower than its elytra. *D. subcaneus*, sp. n., *id.* *ibid.*, Endara, Zanzibar.

Lyprops brevisculus, sp. n., *id.* *ibid.*, Wanga.

Pycnocerides.

Odontopus physodes, Natal, *asperatus*, Gold Coast, p. 355, *speciosus*, p. 356, note, Guinea: Pascoe, l. c. p. 355, spp. nn.

Cyphaleides.

Cyphaleus mastersi, sp. n., *id.* l. c. p. 357, Queensland.

Helopides.

Helops asper, Woll. Wollaston (Tr. E. Soc. 1871, p. 279) proposes the name *obliteratus* for the "state β " of this species.

Helops piligerus, Ktz., probably = *villosus*, Schauf. : Schaufuss, Nunq. Ot. i. p. 193.

Hedyphanes upioides and *dejeani*, Fald., = *tagenoides*, Men., ♀; *hegeteroides*, Fald., = *besseri*, Fald.; *angulicollis*, Muls., = *Entomogonus barthelemit*, Sol. : de Marseul, l. c.

Toxocnema, g. n., Fähræus, l. c. p. 304. Near div. *Misolampides*, Lac. *T. rufitarsis*, sp. n., *id.* l. c. p. 305, Caffraria.

Edemutes pretiosus and *purpuratus*, Pascoe, l. c. p. 355, Philippines, spp. nn.

Cratidus rotundicollis, sp. n., Horn, l. c. p. 328, L. California.

Amphidora tenebrosa, p. 329, L. California, *caudata*, p. 330, Arizona: *id. ibid.*, spp. nn.

Apocrypha clivinoides, sp. n., *id. l. c.* p. 391, California.

Helops edwardsi, sp. n., *id. l. c.* p. 395, Oregon.

Helopinides.

Solenomerus, g. n., Fähræus, *l. c.* p. 306. *S. longipes*, sp. n., *id. ibid.*, Caffraria.

Anavius, g. n., *id. l. c.* p. 307. *A. obesus*, sp. n., *id. ibid.*, Caffraria.

Micrantereus variolosus and *femoratus*, Gerstäcker, *l. c.* p. 64, Endara: spp. nn.

Emyon tristis, sp. n., Fähræus, *l. c.* p. 305, Caffraria.

Meracanthides.

Psorodes granosa, p. 308, *lugens*, p. 309, *id. l. c.*, Caffraria: spp. nn.

Megacanthides.

[H] *Oplochirus nasutus*, *cristatus*, p. 310, *pronus*, *afer*, p. 311, *rufitarsis*, *calcaratus*, p. 312, *clypeatus*, *metallicus*, p. 313, *longitarsis*, *punctatissimus*, p. 314: *id. l. c.*, Caffraria: spp. nn.

Gonocnemis brevicollis, sp. n., Gerstäcker, *l. c.* p. 64, See Jipe.

Amarygmides.

Cyriogeton, g. n., Pascoe, *l. c.* p. 356. Differs from *Amarygmus* in its dilated antennary lobes, fusiform femora, and tarsi densely pilose beneath. *C. insignis*, sp. n., *id. ibid.*, Sylhet.

Eupezus longipennis, Gerstäcker, *l. c.*, See Jipe; *E. luctuosus*, Fähræus, *l. c.* p. 315, Caffraria: spp. nn.

Strongyliides.

Miltopepes, g. n., Gerstäcker, *l. c.* p. 65. Differs from *Praoyena* in its wide convex forehead, which is scarcely divided from the clypeus, and has no interocular furrows; the scarcely dilated apical joint of its max. palpi, shorter intermediate antennal joints, subcordate thorax, and more parallel elytra. *M. latus*, sp. n., *id. ibid.*, See Jipe.

Praygena aulica, sp. n., Fähræus, *l. c.* p. 316, Caffraria.

Dysgena scabripennis, sp. n., Gerstäcker, *l. c.* p. 64, Zanzibar.

Aspidosternum festivum, sp. n., *id. ibid.*, Kiriana.

CISTELIDÆ.

Cteniopus sulphureus, L., is older than *flavus*, Scop., and must stand: Gemminger, C. H. vii. p. 118.

(H) *Omophlus lepturoides*. Künstler (Verh. z.-b. Wien, xxi. Beih. p. 79) discusses injuries to cultivated plants from this species.

(H) *Omophlus mulsanti*, Kirsch, = *Heliotaurus scabriusculus*, Fairm.: Fairmaire, Ann. Soc. Ent. Fr. (4) x. p. 394. Kirsch (C. H. viii. p. 127) demurs to this, on the ground of the extreme difference of the pubescence.

Ectenostoma, g. n., Fåhræus, l. c. p. 317. *E. nigriventris*, sp. n., *id. ibid.*, Caffraria.

Alogista, g. n., *id. l. c.* p. 318. *A. abnormis*, sp. n., *id. ibid.*, Caffraria.

Omolepta, g. n., *id. l. c.* p. 320. Allied to *Dietopsis*, but without its facies. *O. elegans*, sp. n., *id. ibid.*, Caffraria.

Amorphopoda, g. n., *id. ibid.* *A. elateroides*, sp. n., *id. l. c.* p. 321, Caffraria.

Psilonycha, g. n., *id. l. c.* p. 321. *P. campestris*, *tenella*, spp. nn., l. c. p. 322, Caffraria.

Ectatocera, g. n., *id. l. c.* p. 325. Allied to *Cistela*. *E. longicornis*, sp. n., *id. ibid.*, Caffraria.

Dietopsis hirta, sp. n., *id. l. c.* p. 319, Caffraria.

Cistela caffra, p. 322, *vittata*, *affinis*, p. 323, *adusta*, *funesta*, p. 324: *id. l. c.* Caffraria, spp. nn.

Helotaurus gracilior, p. 304, Géryville, *dasytoides* [*rectius dasytoides*], p. 395, Boghari: Fairmaire, l. c., spp. nn.

Æthyssius eros, sp. n., Pascoe, l. c. p. 357, N. S. Wales.

MONOMMIDÆ.

Monomma triplacinum, sp. n., Gerstäcker, l. c. p. 65, Zanzibar.

MELANDRYIDÆ.

Zilora ferruginea, Payk., is recorded from Scotland by Sharp, Ent. M. M. viii. p. 74, and figured in Ent. Ann. 1872, frontisp. f. 1.

Serropalpus striatus. The evidence of this species being British is discussed and deemed insufficient by Rye (Ent. Ann. 1872, p. 76), who remarks that *barbatus*, Schaller, 1783, appears to have priority over *striatus*, Hellenius, 1786.

Anelpistus, g. n., Horn, Tr. Am. Ent. Soc. 1870, p. 88. Differs from *Scotodes* in its thorax being broader than long, with sides rounded in front, gradually narrowing to base, and hind angles not prominent, and its elytra being very little broader than thorax. *A. americanus*, sp. n., *id. ibid.*, White Mountains, N. Hampshire. The author (l. c. 1871, p. 343) subsequently recognizes his genus as identical with *Scotodes*.

LAGRIIDÆ.

Entypodera, g. n., Gerstäcker, l. c. p. 66. Slender, glabrous; head free; thorax oblong, bipartite; elytra punctate-sulcate. *E. anthicoides*, sp. n., *id. ibid.*, Zanzibar.

Syggona [*rectius Syngona*], g. n., Fåhræus, l. c. p. 330. Allied to *Lagria*. *S. concinna*, sp. n., *id. ibid.*, Caffraria.

Adynata, g. n., *id. ibid.* Also allied to *Lagria*. *A. tricolor*, *brevicollis*, spp. nn., *id. l. c.* p. 331, Caffraria.

Lagria distincta, p. 325, *fuscipennis*, *guttata*, p. 326, *vulnerata*, *flavipennis*, p. 327, *eneipennis*, *propinqua*, p. 328, *segnis*, *amæna*, p. 329, *id. l. c.*, Caffraria; *L. mollis*, *semicyanea*, *plebeia*, p. 65, *pulverulenta*, p. 66, Zanzibar, Gerstäcker, l. c.: spp. nn.

Entrapela pallida, *maculicollis*, p. 332, *bivittata*, *trilineata*, *ruficollis*, p. 333, *cyanea*, p. 334: Fåhræus, l. c., Caffraria, spp. nn.

PEDILIDÆ.

Corphyra, Say. Horn, *l. c.* 1871, pp. 278–283, gives a synopsis of the species of the United States, supplementing Leconte's work on the same subject. *C. impressus*, Say, = *collaris*, Say, ♂.

Egestria, g. n., Pascoe, *l. c.* p. 358. Allied to *Diacalla*, but with intercoxal process below the coxal line. *E. tæniata*, *ibid.* pl. xiv. f. 9, ♀, Queensland, *suturalis*, p. 359, N. Australia: *id. l. c.*, spp. nn.

Corphyra vittata, p. 279, California, *fumebis*, p. 280, San Francisco, *lewisi*, p. 281, Colorado: Horn, *l. c.*, spp. nn.

ANTHICIDÆ.

Notoxus imperus, Kies., = *lobicornis*, Reiche: Solsky, B. E. Z. xv. p. 206.

Anthicus vimaiculatus, Ill., occurs in the forest of Fontainebleau: Berce, Ann. Soc. Ent. Fr. (5) i. Bull. p. xxxviii; Pet. Nouv. p. 136.

Anthicus sinuatus, p. 335, *flavitaris*, *caffer*, *fragilis*, p. 335: Fähræus, *l. c.*, Caffraria, spp. nn. (div. 4, Laferté).

MORDELLIDÆ.

Mordella hieroglyphica, p. 336, *lugubris*, *caffra*, *propinqua*, p. 337, *pulla*, p. 338: *id. l. c.*, Caffraria, spp. nn.

Mordellistena cinnamomea, p. 338, *inconstans*, *mærens*, p. 339: *id. l. c.*, Caffraria, spp. nn.

RHIPI[DO]PHORIDÆ.

An unknown species of *Em[m]enadia*, bred from *Eumenes esuriens*, F., in N.W. India, is figured by Horne in Tr. Z. S. vii. pl. xxii. f. 1, c.

Em[m]enadia caffra, sp. n., Fähræus, *l. c.* p. 340, Caffraria.

STYLOPIDÆ.

A short analysis of a proposed monograph by S. S. Saunders on this family is given in Pr. E. Soc. 1871, p. xxxii.

Unknown parasites upon N.W. Indian species of *Icaria* and *Polistes* are referred to by Horne, *l. c.* p. 170 *et seq.*

CANTHARIDÆ.

Cooke, Pharm. J. & Tr. (3) pp. 101 *et seq.*, gives a popular account, with woodcuts, of species reputed to be vesicant.

The young larvæ of *Meloe*, *Sitaris*, *Zonitis*, and *Lytta* (the latter of which has been reared) are recorded as frequently found on the thorax of spp. of *Halictus*, to which they seem more readily attached than to spp. of the *Vespidae* or *Fossoræ*: Lichtenstein, Ann. Soc. Ent. Fr. (5) i. Bull. p. lxxvii.

Mylabrides.

DE MARSEUL (L'Ab. vii. 2^e pt. 1870, partly pub. in 1871) completes his monograph of the European members of this subfamily. According to him *M. caudata* and *tenella*, Walzl., = *elegans*, Ol.; *frohleri*, Gebl., (? also of Germ.) = *splendidula*, Pall.; *trizonata*, Reiche, = *corynoides*, Reiche; *Decatoma 18-punctata*, Klug, = *19-punctata*, Ol.; *Coryna ocellata*, Cast., *pavonina*, Reiche, = *ocellaris*, Ol., which need not be abandoned; *C. lanuginosa*, Gerst., = *myla-*

broides, Cast.; *clavicornis*, Dumér., = *bilbergi*, Gyll. He describes as new, *Mylabris* 18-*maculata*, p. 147, N. Africa; *myrmidon*, p. 154, Biskra; *doriæ*, p. 164, Teheran; *coronata*, p. 170, Upp. Egypt (? = *corynoides*, Reiche, var., sec. auct.); *concinna*, p. 191, Palestine; *Coryna birecurva*, p. 184, Syria; *allardi*, p. 193, Biskra; and in Ann. Soc. Ent. Fr. (5) i. Bull. p. lxvi., indicates and names *becarii*, another new species, from Abyssinia.

Mylabris hottentotta, *myops*, p. 341, *flavicornis*, p. 342, *stali*, p. 343, *spuria*, p. 344, *villosa* (? = *holosericea*, Kl., var., sec. auct.), *bohemani*, p. 345, Fähræus, l. c., Caffraria; *M. præstans*, *amplectens*, *callicera*, *M. (Dices) kersteni*, *deckeni*, *dorsalis*, p. 67, *ambigua*, *parenthesis*, p. 68, Zanzibar, Gerstäcker, l. c.: spp. nn.

Coryna lugens, *pilosa*, spp. nn., Fähræus, l. c. p. 347, Caffraria.

Actenodia curtula, p. 348, *wahlbergi*, p. 349, *id. l. c.*, Caffraria, spp. nn.

Cantharides.

Calospasta elegans, Lec., var. n. *humeralis*, California, Horn, l. c. 1870, p. 93.

Tigrodera erosa, Lec.: varr. from California, *id. ibid.*

Cantharis. C. O. Waterhouse (Tr. E. Soc. 1871, pp. 405-408) describes black spp. with red heads and filiform antennæ, viz. *nepalensis*, Hope, *ruficeps*, Ill. (of which *plumicornis*, Casteln., is queried as the ♂), and 3 new spp., with indications of others.

Eletica luteosignata, p. 349, *wahlbergi*, p. 350, *verticalis* (? præc. ♂), p. 351: Fähræus, l. c., Caffraria, spp. nn.

Calospasta nem[at]ognathoides, *perpulchra*, p. 92, California; *mirabilis* p. 93, S. Arizona: Horn, l. c., spp. nn.

Cantharis rufiventris, Walker, List Col. Lord, p. 16, Wâdy Nash; *C. hirtipes*, Allahabad, *tibialis*, China, p. 406, *assamensis*, Assam, p. 407, Waterhouse, l. c.; *C. (Lytta) magister*, *deserticola*, p. 90, *refulgens*, *auriculata*, *compressicornis*, p. 91, Horn, l. c. California; (*C.*) *L. signifrons*, p. 352, *bicolor*, *fulvicollis*, *rufifrons*, p. 353, Fähræus, l. c., Caffraria: spp. nn.

Epicauta fasciceps, p. 16, Tajura, *bicolor* [preoccupied], p. 17, Wâdy Nash Walker, l. c., spp. nn.

Alosimus opacipennis, sp. n., Fairmaire, l. c. p. 395, Algeria.

Zonitis longicornis, Horn, l. c. p. 93, Illinois; *Z. eborina*, *sellata*, p. 354, *collaris*, p. 355, Fähræus, l. c., Caffraria: spp. nn.

Nem[at]ognathides.

Gnathium. Horn, l. c. p. 94, tabulates the American spp. of this genus, scarcely separable from *Nem[at]ognatha*, and suggests the identity of *G. flavicollis*, Lec., with *francilloni*, Kby.

Gnathium texanum, p. 94, Texas, *nitidum*, p. 95, California: *id. ibid.*, spp. nn.

CEDEMERIDÆ.

Oncomera femorata, F., is recorded from N.W. of England by Ruspini, Ent. M. M. vii. p. 182; and from S.W. of England by Hudd, *ibid.* p. 230.

Ditylus vittaticollis, Gerstäcker, l. c. p. 68, Zanzibar; *cyanipennis*, Horn, l. c. p. 89, Oregon: spp. nn.

Oxaxis sericea, sp. n., *id. ibid.*, Nevada.

Probosca marginata, sp. n., Walker, l. c. p. 17, Cairo.

CURCULIONIDÆ.

FÄHRÆUS (Æfv. Vet. Ak. xxviii. pp. 3-69, 197-291), in describing the species collected by Wahlberg in Caffraria, characterizes a few new genera and many new spp., adopting some of Schönherr's MS. names.

SUFFRIAN (Arch. f. Nat. xxxvii. pp. 122-184) continues his "Verzeichniss der von Dr. Gundlach auf der Insel Cuba gesammelten Rüsselkäfer," from vol. xxxvi. p. 234. Some spp. already known, and also new species, are described in *Tychius*, *Anthonomus*, *Lonchophorus*, *Otidoccephalus*, *Toxentes*, *Phyllotrox*, *Hydronomus*, *Heilipus* [*rectius Ilipus*], *Sternuchus*, *Lixus*, *Smi-eronyx*, *Hypera*, *Anchonus*, and *Listroderes*, of some of which genera the author discusses the characters, according to Lacordaire and Schönherr.

PASCOE (P. L. S. xi., June 8, 1871, pp. 154-218, pls. vi.-ix.) continues his "Contributions towards a knowledge of the *Curculionidæ*" (pt. ii), characterizing many new genera, and describing and figuring new spp. The same author, Ann. N. H. (4) viii. pp. 89-99, characterizes as new 3 genera and 22 spp. of Australian *Curculionidæ* from his own collection, in pt. i. of a proposed series of similar papers, with a brief review of the literature of the subject.

Riley (Canad. Ent. iii. p. 158) refers to silken cocoons spun by larvæ of *Curculionidæ*.

Sitones cambricus, Steph., *Apion angustatum*, K., *Nanophyes geniculatus*, Aubé, and *globulus*, Germ., occur on *Lotus corniculatus* at Meudon: Bedel, Ann. Soc. Ent. Fr. (5) i. Bull. p. xlv.

Microcerides.

Episus tuberosus, Gerstäcker, Arch. f. Nat. xxxvii. p. 68, Uru; *E. hieroglyphicus*, p. 3, *dorsalis*, *angusticollis*, p. 4, *cognatus*, p. 5, *contractus*, p. 6, Caffraria, Fähræus, l. c.: spp. nn.

Microcerus latipennis, p. 6, *costalis*, p. 7, *fallax*, p. 8, Caffraria: *id. l. c.*, spp. nn.

Brachyderides.

Cneorhinus ladificator, Gyll., = *prodigus*, F.; *carinirostris*, Boh., = *exaratus*, Msh.: des Loges, Mitth. schw. ent. Ges. iii. p. 373.

Liophlæus opacus, Chevr., ? = *nubilus*, F., abraded, to which also *geminatus*, Sch., should be referred: *id.* Ann. Soc. Ent. Fr. (5) i. Bull. p. lxxiv.

Barynotus illæsirostris, Fairm., = *squamosus*, Germ.: *id.* Mitth. schw. ent. Ges. iii. p. 373.

Sitones. Künstler (Verh. z.-b. Wien, xxi. Beih. p. 32) discusses injuries to cultivated plants from species of this genus.

Sitones brevicollis, Schön., and *Eusomus ovulum*, Ill., are recorded as British by Saarp: Ent. M. M. viii. p. 83.

Metallites laricis and *geminatus*, Chevr., = *atomarius*, Ol., varr.; *viridi-*

pubens=*scutellaris*, Chevr.; *ovipennis*, Bris.,=*fairmairii*, Kies.; *punctulatus*, Bris.,=*affinis*, Chevr.: des Loges, Ann. Soc. Ent. Fr. (5) i. Bull. p. lxxiv.

Polydrosus intermedius, Zett.,=*fulvicornis*, F.; *niveopictus*, Reiche,=*undatus*, F., var.; *ferrugineus*, Boh.,=*ornatus*, Stev., abraded; *virens*, Kies., and ? *angustus*, Luc.,=*celadonius*, Brullé; *P. senex*, Chevr., *Metalites cylindricollis*, Boh., *Phyllobius candidatus*, Perris,=*Metalites tibialis*, Gyll.; *P. pedemontanus*, Chevr.,=*paradoxus*, Stierl., var.; *pilosulus*, Chevr.,=*mollis*, Boh., ♂, and *villosulus*, Chevr.,=*id.* ♀; *chrysocephalus*, Chevr., is specifically distinct from *armipes*, Sch.; *flavovirens*, Gyll.,=*impressifrons*, Gyll., var.; *martinezi*, Per.,=*xanthopus*, Gyll.; *salsicola*, Fairm., ? = *chrysomela*, Sch., var.: *id.* l. c. p. xxix. Des Loges afterwards (p. lxxv) throws doubt upon his own reference of *M. cylindricollis* to *M. tibialis*. *Phyllobius ligurinus*, Gyll.,=*Polydrosus corruscus*, Germ.; *Phyll. virens*, Boh.,=*Pol. cervinus*, L., var.: *id.* l. c. p. xxx. *Polydrosus pilosulus*, Chevr.,=*xanthopus*, Gyll., *ex typ.*; *peragallonis*, des L.,=*nodipennis*, Chevr.; *griseomaculatus*, Chevr.,=*arvernicus*, des L., ? = *melanostictus*, Chevr.: *id.* l. c. p. lxxiv.

Polydrosus abeillei, des Loges, is a *Piazocnemis*: Chevrolat, *ibid.* p. xlii.

Thylacites cataractus, Boh.,=*mus*, Hbst., ♀; *tessellatus*, Gyll.,=*turbatus*, Gyll., var.; *oblongus*, Graëlls.,=*glabratus*, Gyll.; *depilis*, Fairm.,=*frutillum*, Pz., type, *sec. mus.* Schön.: des Loges, l. c. p. xxx.

Tanymecus argyrostomus, Gyll., *niveus*, Gebl.,=*sibiricus*, Gyll.; *variegatus*, Gebl.,=*robustus*, Fab., ♂, *id.* l. c. p. lxxiv (the synonymy as to these spp., l. c. p. xxx, being stated to be wrong); *stevensi*, Gyll.,=*albus*, Gebl., var.; *vittiger*, Gyll.,=*dilatocollis*, Gyll., *id.* l. c. p. xxx.

Chlorophamus submarginalis, F., *circumcinctus*, Sch.,=*sibiricus*, Gyll., *id.* *ibid.*; *volupti[fi]cus*, Gyll.,=*pollinosus*, F., var.; *pilifer*, Fähr.,=*sellatus*, F., immature, *id.* l. c. p. lxxiv.

Exophthalmus lepidopterus, Gyll., *nec Diaprepes id.*, is changed to *squamipennis*: Gemminger, C. II. vii. p. 119.

Eupholus petiti, Guér.: v. Vollenhoven, Tijdschr. Ent. (2) vi. p. 103, pl. 4. f. 3, describes and figures a var. of this sp. under the name *salawattensis*, and which he considers to unite it with *schænherri*, Guér.

Geonomus murinus and *illetabilis*, Boh.,=*flabellipes*, Ol.; *Phænognathus* should be reunited to this genus: des Loges, l. c. p. xxx.

Epicærus formidosus, *vadosus*, and *fallax*=*imbricatus*, Say: Riley (iii. Rep. Ins. Mo. p. 58), who figures the latter, l. c. f. 21.

Danae, Voll., is altered to *Lacodice* [sic: *Laodice* in Cat. viii. p. 2240], on account of Reiche's prior genus of that name in the *Erotylidæ*: Gemminger, l. c. p. 118.

Psidium, Ill. De Marseul (Nouv. et faits, p. xcvi) tabulates the spp. of this genus, indicating (p. xcvi) a new sp. from Lebanon under the name *tauricola*, which des Loges, in a note criticising de Marseul's tabulation (l. c. p. lxxvi), suggests is a var. of *anatolicum*, Sch. According to him, *P. spinimanum*, Reche.,=*anatolicum* (= *interstitiale*), Sch.

New genera and species:—

Schelopi, des Loges, Ann. Soc. Ent. Fr. (5) i. p. 243. Posterior and intermediate tibiae not caudiculate externally; scrobes very deep, bent beneath the eyes. *S. (Tanymecus) planifrons*, Sch.

Synaptoplus, Gerstäcker, Arch. f. Nat. xxxvii. p. 69. *S. cervinus*, *id. ibid.*, Mombas, Wanga.

Blosyrus globulipennis, Fairmaire, Ann. Soc. Ent. Fr. (5) i. p. 45, I. Mayotte, Comores; *B. angulatus*, Gerstäcker, l. c. p. 68, Wanga; *B. bufæ*, Fähræus, (Efv. Vet. Ak. xxviii. p. 8, Caffraria.

Ectatops cinerosus, *id. l. c.* p. 9, Caffraria.

Mimaulus testudo and *papulosus*, *id. l. c.* p. 10, Caffraria.

Cneorhinus pubescens, Allard, L'Ab. v. p. 470, Cette, Algeria [omitted from Zool. Rec. v.]; *C. cæsicollis*, p. 348, Algeria, *hispanicus*, p. 349, Seville, *rugosicollis*, p. 352, Siberia, des Loges, Mitth. schw. ent. Ges. iii.; *C. ? sculus*, Rottenberg, B. E. Z. xv. p. 228, pl. viii. f. 2, and details (also details of *C. prodigus* and *geminatus*, F., f. 3), Catania.

Aosseterus argentatus, *strigirostris*, p. 11, *cinerascens*, *melancholicus*, p. 12, Fähræus, l. c., Caffraria.

Liophleus atricornis, des Loges, Mitth. schw. ent. Ges. iii. p. 353, Clermont. Chevrolat, Ann. Soc. Ent. Fr. (5) i. Bull. p. xliii, refers this insect, under the name *nigricornis*, to his *opacus*, to which des Loges, *ibid.* p. lxxiv, demurs.

Ædophronus setosus, Fähræus, l. c. p. 13, Caffraria.

Strophosomus variabilis, *ibid.*, *lineatus*, *aspericollis*, p. 14, *ampliocollis*, *convexicollis*, p. 15, *sparsus*, *barbifrons*, p. 16, *setifer*, *ambiguus*, p. 17, *brevicollis*, *strigifrons*, p. 18, *plumbeus*, p. 19, Caffraria: *id. l. c.*

Foucartia ruficornis, Allard, l. c. p. 471, Constantine [omit. Zool. Rec. v.].

Sciaphilus henoni, *id. ibid.*, Constantine [do.]; *S. variegatus*, Fähræus, l. c. p. 20, Caffraria; *S. procerus*, Rottenberg, B. E. Z. xv. p. 230, Palermo.

Chiloneus algericus, p. 349, *carinidorsum*, p. 354, Algeria: des Loges, Mitth. schw. ent. Ges. iii.

Eusomus spheropterus, Allard, l. c. p. 475, Constantine [omit. Zool. Rec. v.]; *E. armeniacus*, Kirsch, B. E. Z. xv. p. 44, Transcaucasia.

Mitophorus æneipennis and *inflatus*, Gerstäcker, l. c. p. 69, Endara; *M. vittatus*, Pascoe, P. L. S. xi. p. 154, pl. vi. f. 5, White Nile.

Brachyderes gougeleti, p. 395, Tangiers, *angustus*, p. 396, Bone, Fairmaire, Ann. Soc. Ent. Fr. (4) x.; *quadripunctatus* and *lesicollis*, *id. l. c.* (5) i. Bull. p. lxxiii, Portugal.

B. (Caulostrophus) javeti, des Loges, Mitth. schw. ent. Ges. iii. p. 353, Taurus; *C. aberrans*, Fairmaire, l. c. p. 397, Morocco.

Sitones giganteus, *id. l. c.* p. 399, Tangiers; *S. guttulatus*, Chevrolat, *ibid.* (5) i. Bull. p. xlii, Nantes (= *ononidis*, Sharp, *teste auct. ibid.*: cf. also Bedel, *ibid.* p. lxiii).

Podinops wahlbergi, Fähræus, l. c. p. 20, Caffraria.

Metallites javeti, des Loges, Ann. Soc. Ent. Fr. (5) i. p. 236, Nîmes.

Polydrosus hispanicus, Spain, *caucasicus*, Georgia, p. 231; *cephalotes*, Hungary, *raffrayi*, Boghari, *fusco-roseus*, Andalusia, p. 232; *pallidivestis*, Spain, Carthage, *brevicollis*, Sicily, *convexifrons*, Greece, p. 233; *neapolitanus*, Sicily, *emerii*, Naples, *abbreviatus*, Tyrol, p. 234; *cinctus* and *leucomarmoratus*, Tangiers, *convexior*, Algeria, p. 235; *subcyaneus*, Algeria, p. 236 (and a var. of *kahri*, Kirsch, named *sculus*, p. 233, Sicily): *id. l. c.* *P. frater*, Rottenberg, l. c. p. 231, Sicily; *P. ballioni*, Lindemann, Bull. Mosc. xlv. p. 174, Moscow.

Thylacites crotchi, Mogador, *asperulus*, Algeria, p. 398; *persulcatus*, p. 399,

Algeria (? = *argentatus*, Perr. : des Loges, *l. c.* p. lxxv), Fairmaire, *l. c.* *T. candidulus*, Spain, p. 236; *marmoratus* and *tigratus*, Morocco, *serripes*, ? Spain, *congener*, Algeria, p. 237; *cribricollis*, Constantine, *oblongiusculus*, Oran, *angustus*, Algeria, p. 238; *pumicus*, Algeria, Morocco, *uhagoni*, Salamanca, *hirtellus*, Spain, Portugal, p. 239; *auricollis*, Algeria; *latithorax*, Toledo, *araneiformis*, Valladolid (? = *insidiosus*, Fairm., *sec. auct.*), p. 240; *schœnherrii*, Algeria, Corsica, Spain, *tomentosus*, Spain, *siculus*, ? Sicily, p. 241; *dubius*, Corsica, Sardinia, *beloni*, Malta, p. 242; *submetallicus*, Spain, p. 243 (and a var. of *fritillum*, Pz., named *insularis*, from Mediterranean isles, p. 242. Two other spp. are indicated, *ibid.* Bull. p. xxx, as new, viz. *obscurus* and *maroccanus*, but the descriptions of these are suppressed, p. lxxv, as the former is stated to be probably identical with *asperulus*, Chev. [? Fairm.], and the latter with *crotchii*, Chev. [? Fairm.]) : des Loges, Ann. Soc. Ent. Fr. (5) i.

Piazomias viridanus and *palliatu*s, Fähræus, *l. c.* p. 21, Caffraria.

Phæognathus reichii, des Loges, *l. c.* p. 246, Greece.

Tanymecus sareptanus, Sarepta, *nevadensis*, Sierra Nevada, *arcuatipennis*, E. Siberia, *femoralis*, Tangiers, p. 244, *cinereus*, *subvelutinus*, and *lethierryi*, p. 245, Algeria, *id. l. c.*; *T. makkaliensis* and *inaffectatus*, p. 22, *rhodopus*, p. 23, Caffraria, Fähræus, *l. c.*; *T. griseus*, Rottenberg, *l. c.*, Sicily.

Siderodactylus falciger, Gerstäcker, *l. c.* p. 69, Endara.

*Macropterus verlore*ni, v. Vollenhoven, Tijdschr. Ent. (2) vi. p. 101, pl. 4. f. 1, Timor.

Cimbus signatus, Fähræus, *l. c.* p. 23, Caffraria.

Polycleis cinereus, p. 24, *longicornis*, *vestitus*, p. 25, *id. l. c.*, Caffraria.

Eupholus bandanus, v. Vollenhoven, *l. c.* pl. 4. f. 2, Banda.

Pachyrhynchus argus, p. 154, pl. 6. f. 6, Philippines, *congestus*, no locality, *cingulatus*, Morty, *inclitus*, Philippines, p. 155, *pinorum*, p. 156, Luzon : Pascoe, P. L. S. xi.

Apocyrtus crosus, Luzon, *wallacii*, Batchian, p. 156, *satelles*, Kaioa, *nitidulus*, Waigiou, p. 157 : *id. l. c.*

Misetes tuberculosus, p. 26, *amplicollis*, p. 27, Fähræus, *l. c.*, Caffraria.

Otiiorhynchides.

DE MARSEUL, Ann. Soc. Ent. Fr. (5) i. pp. 247-252, applies to this sub-family the rule followed by himself in the *Histerida*, viz. not to employ a specific name twice in the same tribe, irrespective of genera; basing his argument upon the difficulty of obtaining unanimity in the definition of the characters of the latter groups. The result is a table of 62 spp., for which he proposes new names, and which it is unnecessary to reproduce here, with the exception of *Otiiorhynchus elongatus*, Stierl., nec Hochh., named *longulus*, and *affinis*, Stierl., nec Hochh., named *assimilis* (the latter almost simultaneously proposed also by Gemminger, C. H. vii. p. 118). To adopt the changes proposed in most of the other cases would, apparently, in the absence of uniformity in this respect, produce more confusion than to retain the names now in use.

Otiiorhynchus ligustici and *Phyllobius oblongus*, L. : Künstler (Verh. z.-b. Wien, xxi. Beih. pp. 86 & 79) discusses injuries to cultivated plants from these spp.

Otiorhynchus tristis, Stierl., nec Scop., is changed to *stierlini*: Gemminger, l. c.

Trogloorhynchus. Bargagli (Bull. ent. Ital. iii. pp. 36-39) repeats the diagnosis of the 5 known spp.

Episomus, Schön. Pascoe, P. L. S. xi. p. 163, tabulates the allied genera.

Peritelus gougeleti, Seidl., 1866, = *P. (Mylocerus) hispanicus*, Chev., 1865: des Loges, Mitth. schw. ent. Ges. iii. p. 374.

Myllacus rhinolophus, Seidlitz, = *Strophosomus baticus*, Schaufuss: Schaufuss, Nunq. Ot. i. p. 159: Kirsch, B. E. Z. xv. p. 206.

Atlantis lauripotens, Woll., is again considered specifically distinct from *noctivagans*, Woll.: Wollaston, Tr. E. Soc. 1871, p. 271.

Phyllobius irroratus, Seidl., nec Boh., is named *irrorellus*: Gemminger, l. c. p. 122.

New genera and species:—

Demenica, Pascoe, l. c. p. 159. Differs from *Episomus* in the distinct club of its antennæ, narrower rostrum, and truncate base of elytra. *D. compressa*, id. l. c. p. 160, W. Africa.

Bryochæta, id. l. c. p. 160. Allied to *Episomus*, but with a stout and longer scape, last joints of funiculus very transverse, distinct metathoracic episterna, and intercoxal process widely truncate. *B. sufflata*, pl. vi. f. 7, and *viridis*, id. *ibid.*, O. Calabar, *pusilla*, id. l. c. p. 161, W. Africa.

Eupiona, id. *ibid.* Allied to *Bryochæta*, but with filiform funiculus and ovate normal club to antennæ. *E. attalica*, id. *ibid.*, O. Calabar.

Antinia, id. *ibid.* Differs from *Episomus* in its deep, naked scrobes, which are bent beneath the eyes, passing only just within their anterior border. *A. eupleura*, id. *ibid.* pl. vi. f. 3, Penang.

Cychrotonus, id. l. c. p. 162. Allied to *Episomus*, but more of the facies of certain *Sciobii*. *C. viduatus*, id. l. c. p. 163, N'Gami.

Diatmetus, Gerstäcker, Arch. f. Nat. xxxvii. p. 69. *D. præmorsus*, p. 70, Kisuani.

Chaunoderus, id. p. 70. *C. stupidus*, *ibid.*, Endara.

Sphrigodes, id. *ibid.* *S. margaritaceus*, *ibid.*, Endara.

Sys'ates, id. p. 71. *S. pollinosus*, *seminudus*, *amplicolis*, *ibid.*, *hystrix*, *amœnulus*, *hirtus*, p. 72, Zanzibar.

Peribrotus, id. p. 72. *P. pustulosus*, *ibid.*, Mombas.

Siteytes glabratus, Pascoe, l. c. p. 157, Saylee.

Otiorhynchus phasma, p. 225, pl. viii. f. 1 & 1a, and *heteromorphus*, p. 226, Rottenberg, B. E. Z. xv., Etna.

O. (Tournieria) griseus, Kirsch, *ibid.* p. 43, Greece.

Trogloorhynchus latirostris, Bargagli, l. c. p. 37, pl. i. figs. 2, 3, & 5 (nec fig. 1, as stated), Sienna; *T. grenieri*, Allard, L'Ab. v. p. 472, Corsica [omitted from Zool. Rec. v.].

Sciobius granosus, p. 27, *marginatus*, *dealbatus*, p. 28, *pollinosus*, *brevicollis*, p. 29, *latipennis*, p. 30, Fähræus, l. c., Caffraria.

Pycoderes plicatus, Gerstäcker, l. c. p. 71, Moschi.

Embrithes muscosus, id. *ibid.*, See Jipe.

Lalagetes pusio, *seminulum*, p. 31, *viridulus*, *pallipes*, p. 32, Fähræus, l. c., Caffraria.

Ellimenistes dorsatus, p. 32, *læscollis*, p. 33, *albidus*, *viridanus*, *setulosus*, p. 34, *constrictus*, p. 35, *id. l. c.*, Caffraria.

Episomus fimbriatus, Sarawak, *turritus*, N. China, p. 158, *iconicus*, p. 159, Cambodia: Pascoe, *l. c.*

Isomerinthus jansoni, *id. Ann. N. H.* (4) viii. p. 90, Lizard Island, Australia.

Platyomicus pedestris, p. 162, pl. vi. f. 8, W. Africa, *cordipennis*, *ibid.* N'Gami: *id. P. L. S.* xi.

Peritelus insularis and *P. (Meira) latiscrobs*, p. 346, *corsicus* and *muscorum*, p. 347, Corsica, des Loges, Mitth. schw. ent. Ges. iii.; *P. ornatus*, Fähræus, *l. c.* p. 35, Caffraria.

Barypithes maurulus, Rottenberg, *l. c.* p. 228, Palermo.

Trachyphlæus setiger, p. 36, *nanus*, p. 37, Fähræus, *l. c.*, Caffraria; *T. aureo-cruciatus*, des Loges, *l. c.* p. 342, Corsica.

Glyptosomus costipennis, Fähræus, *l. c.* p. 36, Caffraria.

Cathormiocerus gracilior, Fairmaire, Ann. Soc. Ent. Fr. (4) x. p. 400, Tangiers; *C. grandini*, des Loges, *l. c.* p. 343, Mostaganem.

Phyllobius lindemanni, Lindemann, Bull. Mosc. xlv. p. 171, Moscow (p a mid-Russian form of *calcaratus*, *sec. auct.*); *P. delicatulus*, Fähræus, *l. c.* p. 37, Caffraria.

Myllocerus auriceps, *id. ibid.*, Caffraria.

Eremnides.

Eremnus acuminatus and *alternans*, p. 38, *viridanus* and *suturalis*, p. 39, *subfissuratus* and *humeralis*, p. 40, Caffraria: *id. l. c.*, spp. nn.

Brachytracheus opatrinus, p. 41, *porosus*, p. 42, Caffraria: *id. l. c.*, spp. nn.

Leptopsides.

Tapinopsis, Blanch., is changed to *Opseotropis*, on account of Solier's prior genus of that name in the *Tenebrionidæ*: Gemminger, C. II. vii. p. 119.

Tropipruhus [sic] *tricristatus*, sp. n., des Loges, *l. c.* p. 348, Auvergne.

Cherrus silaceus, King George's Sound, *punctipennis*, Swan River, p. 157, *mastersi*, K. G. Sound, pl. vi. f. 9, p. 158: Pascoe, P. L. S. xi., spp. nn.

Leptops iliacus, C. York, *cicatricosus*, Queensland, *ovalipennis*, Lizard Island, p. 91, *hypocrita*, S. Australia, *tetraphysodes*, Queensland, p. 92: *id. Ann. N. H.* (4) viii., spp. nn.

Brachycerides.

Theates, g. n., Fähræus, *l. c.* p. 68. Near *Brachycerus*. *T. petiolatus* and *spectator*, spp. nn., *id. ibid.*, Caffraria.

Brachycerus granifer, *ochreosignatus*, p. 43, *luridus*, *ignavus*, p. 44, *picturatus*, *wahlbergi*, p. 45, *impius*, *gravis*, p. 46, *severus*, *impedens*, p. 47, *natalensis*, *brevicostatus*, p. 48, *nodulosus* [preocc.], *oblongus*, p. 49, *auguris*, *ingratus*, p. 50, *socors*, *perplexus*, p. 51, *nodifrons*, *modestus*, p. 52, *scrobipennis*, *subverrucosus*, p. 53, *inordinatus*, *vagabundus*, p. 54, *umbrinus*, p. 55, *ephippiatus*, *clitellatus*, p. 56, *lividicollis*, *contortus*, p. 57, *hybridus*, *lævifrons*, p. 58, *interstitialis*, *hypocrita*, p. 59, *setipennis*, *mcnacha*, p. 60, *collaris*, p. 61, *canalistrostris*, *granistrostris*, p. 62, *pseudoscutellatus*, *peregrinus*, p. 63, *catenulatus*, *squalidus*, p. 64, *ambulans*, *baccatus*, p. 65, *bicornutus*, *errans*, p. 66, *sticticus*, p. 67; *id.*

l. c., Caffraria: *B. subvariolatus*, p. 360, *sericeus*, *nubilus* [? *præc.*, var. *sec. auct.*], *hispidus*, p. 361, *clathratus*, *rectecostatus*, p. 362, *velutinus*, p. 364, *raffrayi*, p. 365, *curtulus*, p. 366, Algeria; *cornifrons*, p. 363, *semicæneus*, p. 365, no locality given; *scutipennis*, p. 363, *parens*, p. 366, Spain; *verpertilio* [*sic*], p. 363, *frimbriatus* [*sic*], p. 365, *ventralis*, p. 366, Austria; *kabylianus*, p. 364, Kabylia; *incertus* and *olivieri* (? = *ægyptiacus*, Ol., *sec. auct.*), p. 367, Egypt; *insularis*, *ib.*, Sicily; *tauricus*, p. 368, Crimea; des Loges, *l. c.*: *B. atrox*, Gerstæcker, *l. c. p.* 72, Zanzibar: spp. nn.

Byrsopsides.

Rhyti[do]rhinus angusticollis, Rosenh., *nec* Boh., is named *stenoderus*, Gemminger, C. H. viii. p. 122.

Hoplitetrachelus spinifer, p. 197, *callosicollis*, p. 198, Caffraria, Fähræus, *l. c.*, spp. nn.

Byrsops bisignatus, sp. n., Fairmaire, Ann. Soc. Ent. (5) i. p. 47, C. of G. Hope.

Synthocus dorsalis, sp. n., Fähræus, *l. c.* p. 198, Caffraria.

Spartocerus rudis, *hypocrita*, p. 199, *umbrinus*, p. 200, *brevipennis*, *depressus*, p. 201, Caffraria: *id. l. c.*, spp. nn.

Rhyti[do]rhinus lituratus, *humerosus* and 3 varr., p. 202, *angulicollis*, p. 203, *costatus*, *sulcirostris*, p. 204, Caffraria: *id. l. c.*, spp. nn.

Terapopus tuberculatus, sp. n., *id. l. c.* p. 218, Caffraria.

Amycterides.

DOHRN (S. E. Z. xxxii. pp. 396-402) commences a revision of this subfamily. According to him, *Amycterus paradoxus*, Stm., = *mirus*, Sch., Boh., both having been described in 1843; *Phalidura* (McL.), Fisch., should more correctly be written *Psalidura*; *Amycterus* (P.) *mirabilis*, Kirby, Linn. Trans. xii., is certainly not identical with Gyllenhal's sp. of that name, sent by Hope to Schönherr, and the latter insect is named *gyllenhali*; the ♀ of *A. mirabilis*, Kirby (*nec* Schön.), in Schönherr's collection, is to be referred to *rufolineata*, McLeay Jr.

Hipporhinides.

Hipporhinus furvus, p. 205, *insignis*, *bohemani*, p. 206, *sulcirostris*, p. 207, *fallax*, *affinis*, p. 208, *caudatus*, *deplorabundus*, p. 209, *arenarius*, *pilifer*, p. 210, *varius*, p. 211, *cinerascens*, *dolorosus*, p. 212, *lineatus*, *vittatus*, p. 213, *costirostris*, *alternans*, p. 214, *monitor*, *corniculatus*, p. 215, *nasutus*, p. 216, *armatus*, *talpa*, p. 217, Caffraria: Fähræus, *l. c.*, spp. nn.

Rhyparosomides.

Dichotrachelus sabaudus, Fairm., = *stierlini*, Gredl.: de Marseul, Ann. Soc. Ent. Fr. (5) i. p. 80.

Eupages baccatus, sp. n., Fähræus, *l. c.* p. 218, Caffraria.

Paracærius verrucatus, *costatus*, spp. nn., *id. l. c.* p. 219, Caffraria.

Dichotrachelus manueli, sp. n., Marseul, *l. c.* p. 79, Mt. Cenis.

Cylindrorrhinides.

Pascoe, Ann. N. H. (4) viii., describes as genn. and spp. nn.:—

Catastygus, p. 93. Scrobe running obliquely to a point below mid-eye, and nearly straight, except at commencement. *C. scutellaris*, *ib.*, *stigma*, p. 94, Queensland; *limbatus*, Pt. Dennison, *rivulosus*, Moreton Bay, p. 94; *textilis*, p. 95, Lizard Island.

Enchymus, p. 95. Post. tibiæ with open corbels; scrobe arched, terminating at some distance from the eye on the side of the rostrum. *E. punctototatus*, *ib.*, S. Australia.

Centyres, p. 96. Facies of *Liophæus*; 3 interm. segments of abdomen equal. *C. turgidus*, *ib.*, Queensland.

Lithinides.

Rhytidophæus nodosus, sp. n., Fairmaire, *l. c.*, Madagascar.

Molytides.

Anisorhynchus curtus, Perris, = *bajulus*, Ol., ♀ var., and a var. of that sp. is referred to under the name *multistriolatus*; *A. ferus* and *costatus*, Boh., are probably specifically identical: des Loges, Mitth. schw. ent. Ges. iii. p. 373.

Molytes carinirostris, Gyll. Kirsch (B. E. Z. xv. p. 45) gives diagnostic characters for this insect, which he asserts to be specifically distinct from *germanus*, L., and to which he assigns *glabrirostris*, Küst., as a syn.; des Loges, *l. c.* p. 372, repeats his opinion [*cf.* Zool. Rec. vi. p. 275] with regard to the specific distinctness of the first two.

Molytes dirus, Hbst., *glabratus*, F., and *lævigatus*, Sch. Kirsch, *l. c.* p. 46, considers these referable to one and the same species, thus confirming Schönherr's dubious opinion to that effect: des Loges (*l. c.*) also considers *dirus* and *glabratus* to be synonymous, and attributes, with doubt, *glabrirostris*, Küst., 'also to them; he describes a var. from Puy-de-Dôme of *coronatus*, under the name *sulcirostris*, and which he considers entitled to specific rank, if the above-mentioned insects be maintained as species.

Cycloteres brullii, Boh., ? = *Trachodes contractus*, Kl.: Fairmaire, *l. c.* p. 52.

Lithocryptus, g. n., des Loges, *l. c.* p. 344. Allied to *Meleus*, especially from its lower side structure, but with approximated eyes, strongly rectilinear head, almost as long as wide, hooks of the tarsi much shorter, &c. *L. arvernicus*, sp. n., *id.* *l. c.* p. 345, Auvergne.

Tiphaura, g. n., Pascoe, P. L. S. xi. p. 164. Scrobes hypobasal (and therefore dubiously placed here), tarsi ciliated, prothoracic margin partially ridged. *T. funerea*, sp. n., *id.* *ibid.* pl. vi. f. 10, Para.

Liosomus scrobifer, sp. n., Rottenberg, B. E. Z. xv. p. 232, Palermo.

Anchonus incrassatus, p. 175, *aspericollis*, p. 176, *rusticus*, p. 177, *bicornis*, p. 179, Cuba: Suffrian, Arch. f. Nat. xxxvii., spp. nn.

Cycloteres bipartitus, sp. n., Fairmaire, *l. c.*, Madagascar.

Elassomyx angulicollis, sp. n., Fähræus, *l. c.* p. 220, Caffraria:

Tanyrhynchides.

Stereorhynchus setipennis, sp. n., Fähræus, *l. c.* p. 220, and var. *suturalis*, Caffraria.

Myorhinus globulosus, *setipennis*, p. 221, *crenulatus*, p. 222, Caffraria: *id.* *l. c.*, spp. nn.

Scythropides.

Cecrastes viridanus, p. 222, *canus*, p. 223, Caffraria: *id. l. c.*, spp. nn.

Scyt[h]ropus javeti, sp. n., des Loges, Ann. Soc. Ent. Fr. (5) i. p. 236, Majorca.

Gonypterides.

Styanax, g. n., Pascoe, *l. c.* p. 164. Intercostal process narrow, tibial spurs two. *S. carbonarius*, sp. n., *id. l. c.* p. 165, pl. ix. f. 4, Sumatra.

Oxyops farinosus, sp. n., *id.* Ann. N. H. (4) viii. p. 96, Albany.

Gonypterus hyperoides, p. 96, Queensland, *turbidus*, p. 97, ? Tasmania: *id. ibid.*, spp. nn.

Hyperides.

Kraatz (B. E. Z. xv. pp. 170-172) briefly characterizes certain species of *Hypera* found in Silesia.

Kirsch (*ibid.* pp. 173-191) tabulates and describes the German species of *Hypera*.

Alolphus nictitans, Boh., is apparently non-distinguishable from *triguttatus*, and a var. is referred to under the name *immaculatus*: des Loges, Mitth. schw. ent. Ges. iii. p. 374.

Hypera lunata, Woll. (= *Phytonomus dauci*, Ol.), is not specifically identical with *fasciculatus*, as Capiomont thinks, and mistakes as to locality by the latter are pointed out; *H. irrorata*, Woll., is distinct from *isabellina*, Boh.: Wollaston, Tr. E. Soc. 1871, pp. 268-270.

Phytonomus polygoni, ♂, and *Coccinella bipunctata*, ♀. Hochhuth (Bull. Mosc. xlv. p. 208) notes a connexion during three days between these insects.

Aterpides.

PASCOE, P. L. S. xi. pp. 165-168, tabulates the 12 genera of this subfamily recognized by him, including as new:—

Aparete, p. 165. Resembles *Ethemaia*, Pasc., but with quadrangular rostrum, 7th joint of funiculus closely connected to club, and narrow tarsi, which are ciliated beneath. *A. palpebrosa*, p. 166, S. Australia.

Dexagia, p. 166. Connected, at long interval, with *Ethemaia*. *D. superciliaris*, *ibid.* pl. vii. f. 2, Batchian.

Hypermetra, p. 167. Allied to *Dexagia*, but with scrobes not connivent beneath rostrum, and tibiae wider at apex and spurless. *H. analis*, *ibid.* pl. ix. f. 5, Mysol.

Cleonides.

Gemminger, C. H. viii. p. 122, changes *Cleonus roridus*, F., *nec* Pall., to *fabricii*; *C. sparsus*, Gyll., *nec* Zoubk., to *schænherrri*; *Larinus brevis*, Gyll., *nec* Hbst., to *gyllenhali*; *Lixus coarctatus*, Luc., *nec* Klug, to *contractus*.

Cleonus dehaani, Fahr., is a *Peribleptus*, to which genus *Lixus strigosus*, Dej., and certain Indian species afford a great analogy in form and characters: Chevrolat, Ann. Ent. Belg. xiv. p. 94.

Cleonus sulcirostris. Künstler (Verh. z.-b. Wien, xxi. Beih. p. 50) discusses injuries to cultivated plants from this species.

Cleonus subsignatus, Harkeko, *venustus*, Tajura, Walker, List Col. Lord, p. 17; *C. angulicollis*, p. 223, *errans*, *concinus*, p. 224, Caffraria, Fähræus, l. c.; *C. mitis*, Gerstäcker, l. c. p. 73, See Jipe, Sennaar: spp. nn.

Larinus saintpierrii, Allard, L'Ab. v. p. 473, W. Africa, Morocco [omitted from Zool. Rec. v.]; *L. cuniculus* (?? Ol. sec. auct.), Walker, l. c., Helio-polis; *L. hirtellus*, Fähræus, l. c. p. 225, Caffraria: spp. nn.

Lixus carinicollis, p. 226, *areicollis*, *subsignatus*, p. 227, *plagiatus*, *albo-einctus*, p. 228, *nebulosus*, *trivialis*, p. 229, *hypocrita*, p. 230, *filum*, *cuneiformis*, p. 231, *pudens*, p. 232, *figuratus*, p. 233, Caffraria, id. l. c.; *L. sulcirostris*, *pinguis*, *baculus*, Gerstäcker, l. c. p. 73, Zanzibar; *L. tardus*, p. 166, *merula*, p. 168, Cuba, Suffrian, l. c.; *L. invarius*, Walker, l. c. p. 18, Mt. Sinai: spp. nn.

Peribleptus decemmaculatus, sp. n., Chevrolat, l. c., Moluccas.

Hylobiides.

Hylobius pinastri, Gyll., is certainly only a small form of *abietis*: des Loges, Mitt. schw. ent. Ges. iii. p. 373.

Pissodes piniphilus, Hbst., is recorded as taken in Britain, but not deemed indigenous, by Bold, Ent. M. M. vii. p. 275.

PASCOE (P. L. S. xi.) describes the following new genera and spp.:—

Ectinura, p. 170. Elytra prolonged as in *Brenthus*. *E. brenthoides*, *ibid.* pl. vii. f. 10, India?

Scolithus, p. 171. Allied to *Aclees*, but with 4-jointed club, ocular lobes, emarginate propectus, &c. *S. acuminatus*, p. 172, f. 8, Sarawak.

Scleuca, p. 173. Allied to *Pissodes*, on account of its anterior coxæ not being approximated, but with ocular lobes to prothorax, and tarsi spongy beneath. *S. amicta*, pl. ix. f. 7, and *leucospila*, *ibid.*, Singapore.

Niphades, p. 174. *Hylobius* with bifid claws. *N. pardalotus*, f. 8, Sarawak, and *costatus*, Aru, *ibid.*

Ozotenus, *ibid.* Allied to *Orthor[h]inus*, but with short, curved, compressed tibiæ and pedunculate post. femora, which are strongly clavate in the middle, and armed with a triangular denticulation. *O. jubatus*, p. 175, f. 3, Amazons.

Pepalosomus zonatus, p. 168, Batchian, Saylee, &c.

Hylobius fasciatus, *ibid.* pl. vii. f. 9, Morty; *notatus*, p. 169, and *papulosus*, p. 170, Java; *scrofa* and *rubulus*, p. 169, Sarawak; *aphya*, p. 170, India.

Aclees porosus and *gyllenhali*, p. 172, Malayan Archipelago.

Erirhinides.

Procas steveni, Gyll., is recorded from Boulogne by Javet, Ann. Soc. Ent. Fr. (5) i. Bull. p. xvii.

Bagous nigritarsis, Thoms., is recorded as British by Sharp: Ent. M. M. viii. p. 83. Kraatz (B. E. Z. xv. p. 169) demurs to Brisout's opinion that this sp. = *lutulentus*, for which he points out that *collignensis*, Hbst., is the older name.

Erirhinus vestitus, Mann. nec Gyll., is changed to *mannerheimi*: Gemminger, C. H. viii. p. 122.

Erirhinus (*Doryt.*) *amplithorax*, N. France, *auripennis*, Corsica, p. 351, 1871. [VOL. VIII.]

meridionalis, S. Spain, p. 352, des Loges, Mitth. schw. ent. Ges. iii.; *E. signatipennis*, Fähræus, l. c. p. 234, Caffraria: spp. nn.

Eutecheus bituberculatus, sp. n., *id.* l. c. p. 233, Caffraria.

Ctenomerus variegatus, sp. n., *id.* l. c. p. 235, Caffraria.

Hydronomus peregrinus, p. 156, *brevirostris*, p. 157, *argillaceus*, p. 159, *tessulatus*, p. 160, Cuba: Suffrian, l. c., spp. nn.

Amphibolocorynus varius, sp. n., Fähræus, l. c., Caffraria.

Meriphilus longirostris, sp. n., Pascoe, Ann. N. H. (4) viii. p. 97, Albany.

Myossita tabida, sp. n., *id.* l. c. p. 98, ? S. Australia.

Phyllotrox liturellus, p. 152, *variegatus*, p. 154, Cuba: Suffrian, l. c., spp. nn.

Ambatides.

Phacemastix[-*tyx*] *baridioides*, sp. n., Fähræus, l. c. p. 236, Caffraria.

Belides.

Dicordylus pupillatus, p. 175, *luctuosus* and *amœnus*, p. 176, Chili: Pascoe, P. L. S. xi., spp. nn.

Rhinotia pruinosa, sp. n., *id.* Ann. N. H. (4) viii. p. 98, S. Australia.

Isacantha congesta, *ibid.*, Wide Bay, Queensland, *bimaculata*, p. 99, Tasmania: *id.* l. c., spp. nn.

Pachyura papulosa, sp. n., *id. ibid.*, Rope's Creek, N. S. Wales.

Cylades.

Cylas semipunctatus and *lævigatus*, Fähræus, l. c. p. 237, Caffraria, spp. nn.

Apionides.

Apion. Künstler (Verh. z.-b. Wien, xxi. Beih. p. 59) discusses injuries to cultivated plants from members of this genus.

Apion tibiale, des Loges, = *difforme*, Germ., var.; *gaudarti*, Tourn., = *tamarisci*, Gyll., *sec. typ.*: des Loges, Mitth. schw. ent. Ges. iii. p. 375.

A. longicolle, Gerst., = *Piezotrachelus asphaltinus*, Sch.: Fähræus, l. c. p. 239.

A. cribricolle, Perr., = *immune*, Kby., and the name *porosicolle* proposed for *cribricolle*, Lec., is therefore withdrawn; *flavimanum*, Mots., *nec* Gyll., is changed to *gilvipes*; *glabratum*, Kies., *nec* Gerst., to *glabrum*; *lanuginosum*, Wenck., *nec* Gerst., to *lanigerum*; *amplipenne*, Mots., *nec* Gyll., to *mutatum*; *crassirostre*, Mots., *nec* Gyll., to *pachyrrhynchum*; *obscurum*, Blanch., *nec* Marsh., to *tenebricosum*: Gemminger, C. H. viii. pp. 122 & 123.

Apion annulipes, Wenck., is recorded as British by Rye: Ent. M. M. viii. p. 159.

Apion æthiops, Hbst. J. Sahlberg (Not. Fenn. xi. p. 367) records this species with the thorax carinate in front.

Apion rubidum [the author, *ib.* note, considers it better to treat *Apion* as masculine, "like the other genera of *Curculionidæ*,"—forgetting *Hypera*, *Calandra*, *Echinodera*, *Gymnetrum*, &c.: the latter genus he, as usual, treats wrongly as masculine, it being clearly neuter], p. 238, *considerandum* and *triviale*, p. 239, Caffraria, Fähræus, l. c.; *A. nasua* and *gallinula*, Gerstäcker, l. c. p. 74, Mombas: spp. nn.

Piezotrachelus gibbipennis, p. 239, *tubulatus*, p. 240, Caffraria: Fähræus, l. c., spp. nn.

Tanaonides.

Aplemonus gibbipennis, sp. n., *id. l. c.* p. 241, Caffraria.

Mecolenus wahlbergi, sp. n., *id. l. c.* p. 242, Caffraria.

Tanaos interstitialis, sp. n., *id. l. c.* p. 241, Caffraria.

Attelabides.

DE MARSEUL (L'Ab. v. pp. 296–316) monographs this subfamily as supplying the necessary link between the similar treatises by Wencker on the *Apionides* and Des Loges on the *Rhinomacerides*.

[This little work appears, probably from the great confusion of the various dates of its separate parts, to have escaped notice in Zool. Rec. v.] No new spp. are described; but the following synonymy is given:—*Apoderus kamtschaticus*, Mots., *morio*, Bon., and probably *dauricus*, Mots., = *coryli*, var.; *Attelabus foveipennis*, Jekel, = *variolosus*, Ol.; *pulvinicollis* and *hispanicus*, Jek., = *curculionides*, of which *maculipes*, Villa, and probably also *atricornis*, Muls., is a var.

Apoderus cinctipennis, Jekel, = *nigripennis*, F., var.: Fähræus, *l. c.* p. 243.

Apoderus coryli and *Attelabus curculionides*. Brief notes on the economy of these spp. are given by Taschenberg, Z. ges. Naturw. xxxviii. p. 383.

Attelabus curculionides. Drechsel (S. E. Z. xxxii. pp. 205 & 206) records a monstrosity in the prothorax of an individual of this sp., apparently interesting as throwing some light upon the true formation of that segment.

Apoderus spinifer, sp. n., Fähræus, *l. c.* p. 243, Caffraria.

Attelabus coquereli, Fairmaire, Ann. Soc. Ent. Fr. (5) i. p. 44, Madagascar; *A. costipennis* and *tuberculosus*, p. 244, *humerosus*, p. 245, Caffraria, Fähræus, *l. c.*: spp. nn.

Rhinomacerides.

DES LOGES (L'Ab. v. pp. 317–428) monographs this subfamily, describing new spp. &c.

[N.B. The same remark applies to this work as that to de Marseul's treatise on the *Attelabides*.] The following synonymy &c. is given:—*Rhynchites pyri*, Mots., = *giganteus*, Mén., of which *rectirostris*, Gyll., is ♀; *semiruber*, Stierl., = *æquatus*, L., for which *purpureus*, L., though the older name, is rejected as dubious; *multipunctatus*, Bach, = *parellinus*, Gyll.; *interpunctatus*, Steph., is adopted for *alliaris*, Payk. (*nec* L.), of which a var. is described, and named *confusus*; *smeraldinus*, Costa, and *longirostris*, Bach, = *eneovirens*, Marsh., var. *fragraria*, Gyll.; *persicus*, Gyll., = *pauzillus*, Germ., var.; *tomentosus*, Gyll., *uncinatus*, Th., = *planirostris*, F.; *olivaceus*, Gyll., = *comatus*, Gyll., ♂; *ophthalmicus*, Steph., *splendidulus*, Kies., = *sericeus*, Hbst.; *luridus*, Boh., = *præustus*, Boh., var.; *Auletes meridionalis*, Duv., = *tubicen*, Boh.

Rhynchites bacchus, *betuleti*, *cupreus*, *auratus*, and *conicus*. Künstler (*l. c.* pp. 81, 88, 82, & 66) discusses injuries to cultivated plants from these spp.

Rhynchites uncinatus, Thoms. Kraatz (B. E. Z. xv. p. 192) refers to German examples of this sp.

Agilus, g. n., Pascoe, P. L. S. xi. p. 176. Differs from *Rhynchites* in its

compressed subfoliate tibiæ, obtect pygidium, and granulated surface. *A. pedestris*, sp. n., *id. l. c.* p. 177, pl. vii. f. 11, Sarawak.

Auletobius, g. n., des Loges, *l. c.* := *Auletes*, Sch., Duv., Lac., *partim*, comprising *maderensis*, Woll., *basilaris*, Gyll., *politus*, Boh. (of which *ilicis*, Géné, is a var.), *cisticola*, Fairm. (= *subplumbeus*, Chevr., = *pubescens*, Kies.), *maculipennis*, Duv., and var. n. *concolor*, and *reichii*, sp. n., p. 407, Arabia.

Rhynchites maximus, p. 338 (P = *giganteus*, var. *trojanus*, Gyll., *sec. auct.*), and *smyrnensis*, p. 342, Smyrna, *jekeli*, p. 348, S. Russia (P = *splendidus*, Kryn., *sec. auct.*), *cribripennis*, p. 355, Tarsus, *syriacus*, p. 388, Greece, Syria, *abeillii*, p. 420, Marseilles, *id. l. c.*; *R. vulpes*, Fähræus, *l. c.* p. 245, Cafraria; *R. caligatus*, Haliday, Ann. Soc. L. Lyon, xviii. p. 125 (Op. Ent. xiv. p. 228), Lucca : spp. nn.

“*Uterocephalides*.”

Auchmeresthes and *Metacinops*, Ktz., are not naturally to be placed among the *Phylobiides*, but are much more allied to the *Rhinomacerides*, being, however, distinct from both, and better placed after the latter, in a group for which the above name is proposed : des Loges, Mitth. schw. ent. Ges. iii. p. 375.

Erodiscides.

Toxentes morio, sp. n., Suffrian, *l. c.* p. 151, Cuba.

Otidocephalides.

Otidocephalus simplex, sp. n., *id. l. c.* p. 150, Cuba.

Balaninides.

Balaninus nucum. Injuries to cultivated plants from this sp. are discussed by Künstler, *l. c.* p. 84.

Balaninus cerasorum, Hbst., *nec* F., is named *herbsti*: Gemminger, C. II. viii. p. 123.

Balaninus notatus, sp. n., Fähræus, *l. c.* p. 246, Cafraria.

Anthonomides.

Botanebius. For observations on this genus, *cf.* Suffrian, *l. c.* p. 125.

Anthonomus pomorum, *pyri*, and *rubi*. Künstler, *l. c.* p. 80, discusses injuries to cultivated plants from these spp.

Anthonomus quadrigibbus, Say, “the Apple-Curculio.” Brief particulars of the habits of this sp. are given, with figures, in i. Rep. Ins. Ont. p. 93: the larva and pupa are figured by Riley, iii. Rep. Ins. Mo. p. 31, f. 11.

Anthonomus prunivida, Walsh, “the plum gouger:” figured, and its habits &c. described by Riley, *l. c.* pp. 39–42, f. 13.

Orchestes sparsus, Gyll., is recorded as British by Sharp, Ent. M. M. viii. p. 83. *O. melanarius*, Kies., synonymous with this sp. according to Brisout, though apparently of more southern range, has occurred at Metz: Leprieur, Ann. Soc. Ent. Fr. (5) i. Bull. p. xxxi.

Anthonomus verrucosus, p. 126, *morbillosus*, p. 128, *luteus*, p. 131, *tigrinus*, p. 135, *costulatus*, p. 137, *pulchellus*, p. 138, *variegatus*, p. 139, *rhaphoides*, p. 142, Cuba: Suffrian, *l. c.*, spp. nn.

Minyrus hirtus, sp. n., Fähræus, l. c. p. 247, Caffraria.

Phacellopterus rufulus, sp. n., *id. ibid.*, Caffraria.

Orchestes variegatus and *pumilus*, *id. l. c.* p. 248, Caffraria, spp. nn.

Coryssomerides.

Lamyrrus bohemani, sp. n., *id. l. c.* p. 249, Caffraria.

Prionomerides.

Ectysrus, g. n., Pascoe, l. c. p. 177. Close to *Prionomerus*, Sch., but with eyes contiguous above, fore tibiæ acuminate, not hooked at apex, ocular lobes to prothorax, &c. *E. villosus*, sp. n., *id. l. c.* p. 178, pl. vii. f. 5, Rio.

Omphasus, g. n., *id. l. c.* p. 178. Head nearly porrect, scrobes oblique, funic. 6-jointed, eyes not approximated; facies of *Magdalis*. *O. ceratus*, sp. n., *id. ibid.* pl. vii. f. 12, Sarawak.

Zeiona, g. n., *id. l. c.* p. 179. The most aberrant of its subfamily; differs from *Omphasus* in delicacy of structure and coloration, deflexed head, approximated eyes, &c. *Z. pulchella*, sp. n., *id. ibid.* pl. vii. f. 6, Sarawak.

Tychiides.

Tychius 5-punctatus. Künstler, l. c. p. 34, discusses injuries to cultivated plants from this sp.

Tychius albovittatus, Bris., *nec* Blanch., is named *albovittis*: Gemminger, C. H. viii. p. 123.

Tychius ephippiatus, Tialet, *pachyderus* and *subasper*, Tangiers, Fairmaire, Ann. Soc. Ent. Fr. (4) x. p. 401; *T. crassirostris*, Kirsch, B. E. Z. xv. p. 48, Silesia; *T. gentilis*, Rottenberg, *ibid.* p. 234, Sicily; *T. albosparus*, p. 249, *discolor*, p. 250, Caffraria, Fähræus, l. c.; *T. discoloma*, p. 122, *auricapillus*, p. 124, Cuba, Suffrian, l. c.: spp. nn.

Sybines cinerascens, sp. n., Walker, List Col. Lord, p. 18, Harkeko.

Cionides.

Nanophyes lythri: J. Sahlberg (Not. Fenn. xi. p. 370) briefly describes a Carelian var.

Cionus nigropunctatus, p. 250, *pustulatus*, *ingra'us*, p. 251, Caffraria: Fähræus, l. c., spp. nn.

Nanophyes tristigma, sp. n., Rottenberg, l. c. p. 235, Sicily.

Gymnetrides.

Gymnetrum linariæ: galls of this sp. on *Linaria vulgaris* are described by Kidd: Ent. M. M. viii. p. 108.

Gymnetrum depressum, Rottenberg, l. c. p. 236, Sicily; *G. biarcuatum*, des Loges, Mitth. schw. ent. Ges. iii. p. 350, Corsica; *G. castaneum*, p. 252, *cinerarium*, p. 253, Caffraria, Fähræus, l. c.: spp. nn.

Miarus arrogans, p. 253, *curtus*, p. 254, Caffraria: *id. l. c.*, spp. nn.

Lemosaccides.

Lemosaccus notatus (pl. vi. f. 4), *electilis*, *catenatus*, *peccuarius*, p. 180, *ustulus*, p. 181, Australia: Pascoe, l. c., spp. nn.

Alcidides.

Alcides chaudiroidi, Guér., is redescribed and figured by Solsky, Hor. Ent. Ross. viii. p. 147, T. v. f. 3.

Alcides coquereli, p. 48, I. Marotte, Madagascar, *costipennis*, p. 49, I. Mayotte, Comores, *olivaceus* (changed to *fairmairii* by Gemminger, C. H. viii. p. 123, on account of *olivaceus*, Gerst.) and *curtirostris*, p. 50, Madagascar, Fairmaire, Ann. Soc. Ent. Fr. (5) i.; *A. magister*, p. 181, pl. ix. f. 9, Aru, *fastuosus*, Sarawak, *auritus*, *ib.* f. 11, Cochinchina, *erro*, China, p. 182, *micronychus*, Cochinchina, *frontalis*, Morty, p. 183, Pascoe, *l. c.*; *A. subvillosus*, p. 254, *subtilis*, p. 255, *affinis* and *simplex*, p. 256, Caffraria, Fähræus, *l. c.*; *A. obsoletus*, Gerstæcker, *l. c.* p. 74, Mombas: spp. nn.

Menemachides.

Menemachus mæstificus and *tristis*, spp. nn., Fähræus, *l. c.* p. 258, Caffraria. *Hoplitopales ambiguus*, sp. n., *id.* *l. c.* p. 259, Caffraria.

Cryptorhynchides.

Acalles pulverulentus, Woll., nec Blanch., is changed to *pulverosus*; *variegatus*, Blanch., nec Boh., to *varius*; *Cryptorhynchus albifrons*, Boh., 1837, nec Boh., 1835, to *frontesignatus*; *nebulosus*, Thoms., nec Boh., to *nubeculosus*; *Cælosternus albotessellatus*, Luc., nec Mots., to *albotinctus*; *tessellatus*, Mots., nec Boh., to *tesserulatus*: Gemminger, C. H. viii. p. 123.

Conotrachelus nenuphar: Saunders (Rep. fruit-gr. Ass. Ont. 1870, pp. 50-55) gives an account of the numbers of specimens taken in different parts of Canada, and of the various modes and times of their capture, from which it would seem certain that the "Plum-Curculio" is most active at night. Reed (i. Rep. Ins. Ont. pp. 118-126) fully discusses the economy of this pest, figuring it and its parasites, and mentioning means for its destruction. Cf. also Riley, iii. Rep. Ins. Mo. p. 11 *et seq.* (stridulating processes, p. 14, note).

Conotrachelus cratægi, Walsh, "the Quince-Curculio," is figured, and its habits, larva, and pupa, &c. are described by Riley, *l. c.* pp. 35-39, f. 12.

Acalles: Wollaston (Tr. E. Soc. 1871, p. 267) refers to the habits of certain Madeiran spp.

Rhinochenus, Lucas: Chevrolat (Ann. Ent. Belg. xiv. pp. 85-93) monographs this genus, which he locates near *Cratosomus*, Schön.

Psilomerus, gen., Fähræus, *l. c.* p. 267. Facies of *Cyamobolus*, but allied to *Macromerus*, from which it differs chiefly in its eyes being distant and its cylindrical femora (name altered to *Meropsilus* by Gemminger, C. H. viii. p. 123, on account of the prior *Psilomerus* of Chevrolat in the *Cerambycidae*). *P. maculipes*, sp. n., *id.* *l. c.* p. 268, Caffraria.

Pascoe (P. I., S. xi.) characterizes the following new genera and spp.:-

Glechinus, p. 184. Represents New-Zealand *Psepholax*, differing in its straight scrobes and declivous mesosternum. *G. talpa*, *ibid.*, New Caledonia.

Deretiosus, *ibid.* To be placed with Lacordaire's 'Ithyporides,' but resembles *Bothrobatys*. *D. aridus*, p. 185, pl. viii. f. 10, Dorey, New Guinea.

Perichius, p. 186. Allied to *Tylodes*, Sch., but with subterminal lateral scrobes, rostrum reticulate-punctate, and flexuous non-attenuate tibiae. *P. verrucosus*, *ibid.* pl. viii. f. 9, Waigiou.

Erebaces, p. 187. Somewhat like *Hexymus*, but with finely facettèd eyes and pectoral canal open at apex. *E. angulatus*, pl. viii. f. 8, Batchian, *pleuricausta*, *ibid.*, Morty.

Hexymus, p. 188. Apparently allied to *Poropterus*, though the meta-thoracic episterna are very large: no salient characters. *H. tuberosus*, *ibid.* pl. vii. f. 3, Queensland.

Diatassa, p. 192. Comes after *Cyamobolus*, Sch.; femora elongate, subpedunculate, much thickened at apex, strongly dentate beneath, reaching beyond apex of body. *D. phalerata*, p. 193, pl. ix. f. 2, Mysol.

Perissops, p. 193. Allied to *Enteles*, but with a stoutish and subarcuate rostrum, the pectoral channel closed (cavernous) at apex, rather long metasternum, and short legs. *P. (E.) ocellatus*, Redt.; *P. mucidus*, Queensland, *iliacus*, Gilolo, Mysol, p. 194.

Orochlesis, p. 194. Allied to *Perissops*, but with shorter rostrum, prothorax at base as broad as elytra, femora grooved for reception of tibiæ, and two basal segments of abdomen unusually large. *O. annularis*, pl. viii. f. 2, Dorey, *solea*, Batchian, *flesina*, Aru, p. 195.

Apries, p. 196. Allied to *Chatectetorus*, Sch.; base of rostrum transversely grooved on each side before eyes. *A. eremita*, pl. ix. f. 6, Batchian, *palliatu*s, Saylee, *ibid.*

Zeugenia, p. 197. Broader than *Chatectetorus*, and with the three intermediate segments of abdomen of equal length. *Z. histrio*, pl. viii. f. 11, *ibid.*, *figurata*, p. 198, Sarawak, *histrionica*, *ibid.*, Penang.

Omydaus, p. 198. Allied to *Gasterocercus*, with the facies of certain *Plinthi*; metathoracic episterna well marked. *O. plinthoides*, p. 199, New South Wales.

Endymia, p. 199 (no differential characters specified). *E. vipio*, p. 200, pl. viii. f. 5, ♂, Batchian, Dorey.

Panopides, p. 200. Legs long and slender. *P. anticus*, p. 201, pl. viii. f. 4, Tondano.

Glyphagia, p. 201. First abdominal segment with cup-shaped cavity, queried as sexual. *G. insculpta*, *ibid.*, Batchian.

Sybulus, p. 202. Facies of *Crypt. lapathi*; no differential characters specified. *S. peccuarius*, Batchian, *incensus*, Singapore, *ibid.*

Rebius, p. 203. Near *Enteles*, Sch., but with coarsely facettèd eyes and sulcate tibiæ. *R. latifasciatus*, *ibid.* pl. viii. f. 3, Tondano.

Nechyrus, *ibid.* Claw-joint long, prothorax and elytra mostly tufted; facies of *Chemargus chamaleon*. *N. lemur*, pl. viii. f. 7, p. 204, *paniscus*, p. 205, Amboyna; *puncticollis*, p. 204, Aru; *ruidus*, p. 205, *funebri*s, p. 206, Batchian; *geniculatus*, p. 205, Mysol; *notatus*, Saylee, *porcatus*, Ceram, p. 206; *satyrus*, p. 207, Gilolo.

Syrichius, p. 207. Differs from *Nechyrus* in its thicker femora, of which the anterior pair are toothed beneath, coarsely facettèd eyes, and elongate-cordate elytra. *S. roridus*, *ibid.*, Kaioa; *dissipatus*, Morty, *frontalis*, Bouru, *proletarius*, Matabello, *servulus*, Dorey, p. 208.

Nedymora, p. 209. Facies of *Entyrhinus*, but allied to *Syrichius*, from which it differs in its slightly elongate metasternum and its apically open pectoral channel, which is limited by the mesosternum and impinges on the metasternum. *N. ventricosa*, *ibid.* pl. viii. f. 1, Aru.

Æsychora, *ibid.* Antennæ with short scape, 7-jointed funiculus, of which

the first two joints are the longest and the rest short, triangularly dilated, and produced inwardly at the apex, and a distinct ovate club. *Æ. notaticollis*, p. 210, Sarawak.

Amalthus, p. 211. Allied to *Blepiarda*, but with a stout rostrum and conical prothorax, which is much narrower at base than the base of elytra. *A. insignis*, p. 212, pl. vii. f. 4, Morty.

Dætes, p. 212. No differential characters specified: possibly allied to *Mecistostylus* group: funiculus 6-jointed, club apparently non-articulate. *D. albopictus*, *ibid.* pl. viii. f. 6, Goram.

Amydala, p. 213. Of *Sympiezoscetus* group; club of antennæ elongate, cylindrical; first abdominal segment laminated. *A. abdominalis*, *ibid.* p. vi. f. 11, Queensland.

New species :—

Itthyporus fallax and *signatus*, Fåhræus, *l. c.* p. 260, Caffraria.

Mitrephorus capucinus, p. 185, *albifrons*, p. 186, Brazil: Pascoe, *l. c.*

Aulorhinus inæqualis, Fåhræus, *l. c.* p. 261, Caffraria.

Ocladius variabilis, *ibid.*, *subundulatus*, p. 262, *obliquesetosus*, *castaneipennis*, p. 263, *interstitialis*, *coccosus*, p. 264, *basalis*, *sulcicollis*, p. 265, Caffraria, *id. l. c.*; *O. coquereli*, Fairmaire, Ann. Soc. Ent. Fr. (5) i. p. 53, Madagascar.

Camptorhinus dorsiger, *id. ibid.*, Nossi-Bé.

Poropterus exitiosus, *waterhousii*, p. 189, *hariolus* (pl. vii. f. 7), *sphacelatus*, p. 191, *verres*, p. 192, Queensland; *ellipticus*, p. 189, New South Wales; *morbillosus*, Tasmania, *stercuosus*, Adelaide, *mustoideus*, Batchian, p. 190; *approximatus*, p. 191, Kaioa: Pascoe, *l. c.*

Blepiarda voluta, Dorey, *vitiata*, Aru, p. 210; *neophyta*, Dorey, p. 211: *id. l. c.*

Acalles setulipennis, p. 350, Corsica; *raffrayi*, p. 355, Algeria: des Loges, Mitth. schw. ent. Ges. iii.

Nesiotes horridus, Wollaston, Ann. N. H. (4) viii. p. 404, St. Helena.

Analcis fragrarie, Riley, iii. Rep. Ins. Mo. pp. 42–44, f. 14, Illinois, Missouri ("the strawberry crown-borer").

Cryptorhynchus arcuatus and *nubilosus*, Fåhræus, *l. c.* p. 266, Caffraria.

Rhinochenus rougieri, pp. 6 & 93, pl. 1. f. 2, *cinereopunctatus*, p. 90, *bahiensis*, and 3 varr. p. 92, Bahia; *hercules*, p. 86, *innotatus*, p. 92, Columbia; *x-rubrum*, p. 87, *transversalis*, p. 91, Cayenne; *lucasi*, p. 88, *trilineatus*, p. 89, Amazons; *striatus* and *fimbriatus*, p. 88, Brazil; *stenaspis*, p. 90, New Granada; *brevicollis*, p. 91, no locality: Chevrolat, *l. c.*

Crypharis rosaliæ, Rottenberg, B. E. Z. xv. p. 240, Sicily.

Zygopides.

PASCOE, Ann. N. H. (4) vii. pp. 198–222, 258–266, pls. xv. & xvi., catalogues the spp. of this subfamily found by Wallace in the Eastern Archipelago, characterizing many new genera and spp. He tabulates the genera, and, by including *Sphadasmus* and *Ilacuris*, enumerates all known as Asiatic or Australian.

The following observations occur:—*Mecopus audineti*, Rld., = *bispinosus*, Web. (nec F.); *Agametis*, Pasc., is recharacterized; *Macrobamon*, Lac., = *Odoacis*, Pasc.; the type of *Chirozetes*, Pasc., = *Rhynchænus sphærops*, Wied.;

Arachnopus, Guér., should found a subfamily distinct from the normal *Zygopides*; *Thyestetha nitida* is figured, pl. xvi. f. 8.

He describes the following new genera and spp. :—

Talanthia, p. 206. Facies of *Mecopus*, but antennæ unusually long, the scape extending to the posterior border of the eye. *T. phalangium*, p. 207, pl. xv. f. 4, Penang.

Ganyopsis, p. 209. Facies of *Agametis*, but funicle different, rostrum raised at base, forming a crest between the eyes, and apical margin of thorax not sloped or sinuate above. *G. leucura*, *ib.* pl. xv. f. 7, Malacca.

Dadania, p. 212. Ant. tibiæ bisinuate on inner edge; ant. femora strongly toothed beneath, stout. *D. mesoleuca*, pl. xv. f. 1, Mysol, *meleagris*, Sarawak, p. 213.

Phylaitis, p. 213. Ant. tibiæ slender, of equal breadth, femora slightly toothed. *P. v-album*, pl. xv. f. 6, Macassar, *lineata*, Mysol, *pusio*, Sarawak, p. 214; *cyclops*, p. 215, Sarawak.

Pempheres, p. 215. Ant. tibiæ flexuous, 2nd basal joint of funiculus twice as long as the first (equal in *Phylaitis*). *P. trilineata*, pl. xv. f. 2, Batchian, *habena*, Singapore, *ibid.*

Emexaure, p. 216. Funiculus 7-jointed, tarsi long and linear. *E. gallinula*, *ibid.* pl. xvi. f. 1, Sarawak.

Hemrippa, *ibid.* Oblong, subcylindrical, with 7-jointed funiculus. *H. amœna*, p. 217, pl. xv. f. 5, Macassar.

Metialma, p. 217 (no differential characters given). *M. scenica*, *ib.* note, Bombay, *signifera*, p. 218, note, H. Kong, *navia*, p. 218, pl. xvi. f. 4, Macassar, *novata*, *ib.*, Aru.

Brimoda, p. 219 (do.). *B. pagana*, *ibid.*, Singapore.

Ospilia, *ibid.* Allied to *Metialma*, but with rostrum triangularly compressed at the base, the interm. and post. tibiæ straight, sublinear, and a more elliptic body. *O. flavirostris*, Mysol, *onca*, Morty, *apicalis*, Sarawak, p. 220; *undata*, p. 221, pl. xvi. f. 6, Batchian.

Nauphaus, p. 221. But for its large contiguous eyes, not covered by ocular lobes in repose, would be placed in *Cryptorhynchides*. *N. miliaris*, p. 222, pl. xvi. f. 3, Waigiou.

Telaugia, p. 260. Pectoral canal not limited behind, rostrum not extending beyond intermediate coxæ. *T. coccosa*, p. 261, Batchian.

Idotasia, p. 261. Also found in N. Australia. *I. nasuta*, pl. xvi. f. 2, Dorey, *ebriosa*, Salwatty, *ibid.*; *inclusa*, Mysol, *scaphioides*, Batchian, *elliptica*, Ceram, p. 262.

Semiathe, p. 262. Resembles *Idotasia*, but with attenuate rostrum, distinct scutellum, and femora not canaliculate beneath. *S. rufipennis*, Dorey, *ophthalmica*, Mysol, p. 263.

Xychusa, p. 263. Thorax narrower at base than in middle, with grooved margin; upper edge of femora clothed with white scales, as in two preceding genera. *X. larvata*, *ibid.*, Aru.

Elichora, p. 264. Approaches *Xychusa* in its extremely short metasternum, but with longer rostrum and pectoral canal: facies of *Thyestetha*, but allied to *Idotasia*. *E. coruscans*, *ibid.*, Batchian.

Nyphaëa, *ibid.* Intercoxal process narrowed: resembles *Monomma* or *Chelonarium*. *N. monommoides*, p. 265, pl. xvi. f. 7, Ceram.

Mecopus spinicollis, p. 204, pl. xv. f. 8, Java, *cuneiformis*, *ib.*, Sarawak;

pulvereus, p. 205, pl. xv. f. 3, Macassar, *tenuipes*, *ib.*, Dorey, Aru, *collaris*, *ib.* note, Fiji I., *serrirostris*, Batchian, *lituratus*, Tondano, p. 206.

Agametis agrestis, p. 207, *deleta* and *morata*, p. 208, Sarawak; *ortyx*, *ib.*, Mysol.

Odoacis pedestris, p. 210, Sarawak and Labuan.

Chirozetes sectator and *junix*, Sarawak, *auguralis*, Aru, *nervosus*, pl. xv. f. 9, Amboyna, p. 211; *grammicus*, p. 212, Mysol.

Sphadasmus brahminus, p. 203, note, Bengal.

Arachnopus binotatus, p. 258, *sannio*, p. 259, Aru; *wallacii*, p. 258, Gilolo; *phaleratus*, pl. xvi. f. 9, *simius*, p. 259, Ceram.

Psalistus, g. n., Gerstäcker, l. c. p. 75. *P. sordidus*, sp. n., *id. ibid.*, Mbaramu.

Mecopus caffer, sp. n., Fähræus, l. c. p. 268, Caffraria.

Sphadasmus albosignatus, *id. l. c.* p. 269, Caffraria; *S. figuratus*, Gerstäcker, l. c. p. 74, See Jipe: spp. nn.

Tachygonides.

Ivalma, g. n., Pascoe, P. L. S. xi. p. 214. An isolated form, but to be placed near *Dinorhopala*, Pasc., though its intermediate and posterior coxæ are approximated. *I. rufescens*, sp. n., *ibid.* pl. ix. f. 1, Singapore.

Isorhynchides.

Rhadinocerus afflictus, *mærens*, p. 271, *suturalis*, *lineatus*, p. 272, *flavicornis*, *signifer*, p. 273, Caffraria: Fähræus, l. c., spp. nn.

Ellatocerus [*script. Ellatocerus*] *subfasciatus* [? described by Lacordaire, Gen. vii. p. 176], sp. n., *id. l. c.* p. 274, Caffraria.

Ceuthorhynchides.

Ceuthorhynchus assimilis, *macula-alba*, & *sulcicollis*, and *Cæliodes fuliginosus*. Künstler (Verh. z.-b. Wien, xxi. Beih. pp. 47, 37, 39, & 36) discusses injuries to cultivated plants from these spp.

Ceuthorhynchus rotundatus, Bris., and *Ceuthorhynchideus pulvinatus*, Gyll., are recorded as British by Sharp, Ent. M. M. viii. p. 83; and the characters of *C. crotchii*, Bris., are referred to by Rye, *ibid.* p. 159.

Ceuthorhynchideus troglodytes ♂ is recorded in cop. with *Cæliodes didymus* ♀ by E. A. Waterhouse, *ibid.* p. 66.

Cæliodes setosus, p. 274, *stigma*, p. 275, *glabrirostris*, p. 277, Caffraria, Fähræus, l. c.; *C. pudicus*, Rottenberg, B. E. Z. xv. p. 237, Sicily: spp. nn.

Ceuthorhynchus micans, S. France, *perrisi*, Madrid, *præustus*, Algeria, p. 436, *hampii*, Hungary, *crotchii*, England, p. 437, *frontalis*, France, Germany, England [occurs on *Plantago lanceolata*: Bauduer, Ann. Soc. Ent. Fr. (5) i. Bull. p. xxxix], *dawsoni*, England, Fréjus, p. 438, *numidicus*, Constantine, *alternans*, Madrid, *pyrenæus*, Gavarnie, p. 439, *rufipes*, Spain, Morocco, *thlaspi*, Pyrenees, p. 440, *siniks*, Baden, *parvulus*, Paris, Austria, p. 441, *judeus*, Jerusalem, *subglobosus*, Pyrenees, p. 442, *zurlo* and *cupulifer*, Biskra, p. 443, *biimpressus*, Algeria, *rugicollis*, Constantine, p. 444, *funicularis*, Bone, *canaliculatus*, Transsylvania, p. 445, *pandellii*, Pyrenees, *smaragdinus*, S. France, Italy, p. 446, *viridipennis*, Provence, Algeria, *ferrarii*, Syria, p. 447, *sulcatus*, Crimea, *duvali*, S. France, p. 448, *intermedius*, Pyrenees, p. 449, *griseus*,

France, Germany, *plumbeus*, Germany, p. 450, *subpilosus*, Madrid, *schœnherri*, France, p. 451, *rotundatus*, France &c., p. 452, *subulatus* and *antennalis*, Madrid, p. 453, *obscurus*, Aranjuez, *soricinus*, Constantine, p. 454, *insidiosus*, Escorial, p. 455, *squamulosus*, Spain, *algericus*, Algeria, Sicily, p. 456, *carinicollis*, Syria, *sublineellus*, Athens, p. 457, *arcasi*, Madrid, p. 458, *javeti*, Germany, p. 459, *gratiosus*, Provence, p. 460, *kraatzii* and *hungaricus*, Hungary, p. 461, *austriacus*, Austria, p. 462, *italicus*, Italy, p. 463 [all omitted from Zool. Rec. v.], Ch. Brisout de Barneville, L'Ab. v.; *C. vocifer*, Rottenberg, l. c. p. 238, Sicily; *C. arcuatus* [preoccupied] and *profanus*, Fähræus, l. c. p. 276, Caffraria: spp. nn.

Ceuthorhynchideus porcellus, sp. n., id. l. c. p. 277, Caffraria.

Baridiides.

Henri Brisout de Barneville, Ann. Soc. Ent. Fr. (4) x. pp. 287-320, completes his monograph of this group, according to which *Baridius opiparis*, Duv., occurs on *Sinapis incana*; *spoliatus*, Sch., on *Camphorosma monspeliaca*; *scolopaceus*, Germ., on *Salicornia herbacea*, *Succeda maritima*, and *Portulaca maritima*; *t-album*, L., on *Cladium germanicum* and *Lysimachia vulgaris*; *cuprirostris*, F., on *Diplotaxis tenuifolia*; *lepidii*, Germ., on *Nasturtium sylvestre* and *amphibium*; *B. siculus*, Schön., = *cuprirostris*, F., var.; *chloris*, F., *chlorodius*, Sch., *pulchellus*, Luc., = *cærulescens*, Scop.; *pallidicornis*, Boh., = *scolopaceus*, Germ., var.

Baridius crinipes, H. Brisout, = *loricatus*, Sch.: des Loges, *ibid.* (5) i. Bull. p. lxxv.

Baridius opiparis, Duv., = *picturatus*, Mén., and occurs at Batkak-Koum and Tangiers: Kraatz, B. E. Z. xv. p. 206.

Baridius chloris, F.: Künstler, l. c. p. 41, discusses injuries to cultivated plants from this sp.

Baridius chlorizans, Germ., is recorded as British by Sharp, l. c.

Baridius scolopaceus is figured in Ent. Ann. 1872, frontisp. f. 8.

Baridius analis: Bedel, Ann. Soc. Ent. Fr. (5) i. Bull. p. xxxix, indicates *Inula dysenterica* as probably the food-plant of this sp.

Corynemerus, g. n., Fähræus, l. c. p. 281. Allied to *Baridius*. *C. femoralis*, sp. n., id. *ibid.*, Caffraria.

Baridius tenuirostris, p. 291, Algeria, Syria, *vicinus*, Jerusalem, Beyrouth, and *alboguttatus*, Biskra, p. 294, *setiferus*, p. 296, Sicily, Algeria, *albo-maculatus*, p. 298, Spain, *nivalis*, p. 305, Spain, Algeria, *fallax*, p. 311, Frankfort, Spain, France, *andalusiacus*, p. 315, Cordova, Chiclana, H. Brisout, l. c.; *B. speciosus* and *sculptilis*, Gerstäcker, l. c. p. 75, Zanzibar; *B. pertusicollis*, Fairmaire, Ann. Soc. Ent. Fr. (5) i. p. 54, I. Mayotte, Comores; *B. ambiguus*, p. 278, *caliginosus*, p. 279, *picipes*, *parapleurus*, p. 280, Fähræus, l. c., Caffraria: spp. nn.

Calandrides.

Protocerus molossus, Ol., is a perfectly good species, and occurs at Celebes and Malacca: Pascoe, P. L. S. xi. p. 216.

Sphenophorus zœæ, Walsh: Riley figures (f. 22) and reproduces the original description (in 'Practical Entomologist') of this spp.: iii. Rep. Ins. Mo. p. 59.

Sphenophorus pulchellus, Schön., is figured (f. 23), and evidently considered specifically identical with *13-punctatus*, Say, by Riley, *l. c.* p. 60.

Sphenophorus pumilus, All., ?=*meridionalis*, Gyll., var.: des Loges, Mitth. schw. ent. Ges. iii. p. 374.

Sphenophorus cinctus, Montr., nec Gyll., is named *circumscriptus*: Gemminger, C. H. viii. p. 123.

Sitophilus granarius. Künstler, *l. c.* p. 20, discusses injuries to cultivated plants from this sp.

Aphyoda, g. n., Pascoe, *l. c.* p. 214. Has a 7-jointed funiculus, and probably, with *Ithaura*, constitutes a distinct subfamily between the *Cumyloscelides* and *Calandrides*. In facies approaching the *Brenthidæ*. *A. diara*, pl. vii. f. 1, Dorey, *brenthoides*, Waigiou: *id. l. c.* p. 215, spp. nn.

Ithaura, g. n., *id. ibid.* Of varnished appearance; funiculus 7-jointed (no differential characters specified). *I. strangulata*, sp. n., *id. l. c.* p. 216, pl. vi. f. 2, Columbia.

Protocerius fervidus, sp. n., *id. ibid.*, Kumaon.

Cyrtorhinus caffer, sp. n., Fähræus, *l. c.* p. 282, Caffraria.

Sphenophorus gigas, sp. n., *id. ibid.*, Caffraria.

Cossonides.

Amaurorhinus narbonnensis, Bris.,=*bonnairii*, Fairm.: des Loges, Mitth. schw. ent. Ges. iii. p. 374.

Thaumastomerus, Woll., = *Acanthomerus*, Boh.; *T. chevrolati*, Woll., = *armatus*, Boh.: Wollaston, Ann. N. H. (4) viii. p. 402.

Phlæcophagus spadix, Hbst., occurs in stumps under salt-water: Champion, Ent. M. M. viii. p. 85. *P. scalptus*, Sch., is not specifically distinct from this insect: des Loges, Ann. Soc. Ent. Fr. (5) i. Bull. p. lxxiv.

Rhyncolus gracilis, Boh., nec Rosenh., is named *tenuis*, Gemminger, C. H. viii. p. 123: Rosenhauer's sp. recorded as British by Sharp, Ent. M. M. viii. p. 84.

Mimus, "nov. gen. trib. *Cossonid. propinquum*," Fähræus, *l. c.* p. 283. No differential characters given. *M. natalensis*, sp. n., *id. l. c.* p. 284, Caffraria.

Microxylobius dimidiatus, *angustus*, and *cossonoides*, St. Helena, Wollaston, *l. c.* pp. 402 & 403, spp. nn.

Raymondia sicula, sp. n., Rottenberg, *l. c.*, Palermo.

Phænomerus leucogrammus, sp. n., Gerstäcker, *l. c.* p. 74, See Jipe.

Cossonus fasciolatus, Fairmaire, Ann. Soc. Ent. Fr. (5) i. p. 55, I. Mayotte, Nossi-Bé; *C. carinicolis* and var., p. 284, *incivilis*, p. 285, *immeritus*, p. 286, Caffraria, Fähræus, *l. c.*; *C. procerus*, Gerstäcker, *l. c.* p. 75, Endara: spp. nn.

Caulotrypis pyricollis, sp. n., Wollaston, Tr. E. Soc. 1871, p. 265, Madeira.

Rhyncolus hervii, sp. n., Allard, L'Ab. v. p. 475, Finisterre [omitted from Zool. Rec. v.].

SCOLYTIDÆ.

RATZBURG (Verh. Ver. Brand. xii. pp. 80-87) publishes an entomophytological article, entitled "Ueber die Esche und den Eschenborkenkäfer (*Hylesinus fraxini*), und über die Angriffe der Laubholz-Borkenkäfer

überhaupt," in which he criticizes the views of Audouin and others as to the economy of the *Xylophaga*.

CHEVRIER (Mitth. schw. ent. Ges. iii. pp. 332-336) records his opinion, founded on personal observations, that the *Xylophaga* do not attack sound trees, but only those affected by abnormal vegetation, produced by different causes, but invariably resulting in an alteration of the sap and in the death of the tree.

Bostrychus (*Xyleborus*) *dispar*, *Hylastes trifolii*, *Scolytus pruni* and *rugulosus*: Künstler (Verh. z.-b. Wien, xxi. Beih. pp. 63, 56, 62, & 63) discusses injuries to cultivated plants from these spp.

Hylastes decumanus, Er. (1836) = *glabratus*, Zett. (1828): Sahlberg, B. E. Z. xv. p. 206.

Hylurgus minor, Htg., and *Cryphalus granulatus*, Ratz., are recorded from Great Britain by Sharp: Ent. M. M. viii. pp. 74 & 84.

Polygraphus pubescens, Fab., is recorded from England by Rye, *ibid.* p. 82, who recapitulates its generic and specific characters.

Kissophagus (*rectius Cissophagus*) *hederæ*, Schm., and *Xylechinus pilosus*, Ratz., are recorded as British, and their generic and specific characters recapitulated by Rye (*ibid.* p. 107), who notices errors in the descriptions given by Schmidt, Redtenbacher, and Thomson.

Hylesinus fraxini is recorded by Colbeau (Ann. Ent. Belg. xiv. c.-r. p. xviii) as occurring in large numbers, in the perfect state, in the interior of peaches.

Xyloterus bivittatus, K., *cavifrons*, Mann., = *lineatus*, Gyll.: Eichhoff, B. E. Z. xv. p. 137.

Tomicus bidens and *chalcographus* are not strictly to be referred to *Pityophthorus*, to which genus *Cryphalus*, Leconte (*nec* Er.) belongs; *C. atratulus*, Lec., probably = *P. cribripennis*, Eich.: *id. ibid.*

Stephanoderes, g. n., *id. l. c.* p. 132. Allied to *Cryphalus*, but with 5-jointed funiculus; distinguished from *Hypoborus* by retractile subglobose head, serrated ant. tibiæ, &c. *S. (Hypoborus?) setosus*, Eich.; *S. elephas*, I. of France, *chapuisi*, N. America, *opacus*, New Granada, *id. ibid.*, *asperulus* (in Cassia), *pulverulentus*, Mexico, *seriatus*, New Orleans, *obscurus*, Antilles, *id. l. c.* p. 133, spp. nn.

Hyllocurus, g. n., *id. l. c.* p. 133. Head retractile, subglobose, funiculus 6-jointed, mentum subcordate, 1st joint of lab. palpi longer than both 2nd and 3rd; tibiæ sublinear. *H. elegans*, sp. n., *id. l. c.* p. 134, Teapa.

Xyloctonus, g. n., *id. l. c.* p. 134. Allied to *Cryphalus*; eyes bipartite, funiculus 6-jointed, club circular-imbricate; tibiæ compressed, first joint of lab. palpi twice as long as two next. *X. scolytoides*, sp. n., *id. ibid.*, Natal.

Araptus, g. n., *id. l. c.* p. 136. Head globose, eyes simple, funiculus 5-jointed, club solid, very large, tibiæ linear, mentum triangular, ligula lanceolate. *A. rufopalliatius*, sp. n., *id. ibid.*, New Granada.

Diamerus pulverulentus, sp. n., Gerstäcker, *l. c.* p. 76, Zanzibar.

Crypturgus mediterraneus, Hyères, and *dubius*, Pyrenees: Eichhoff, *l. c.* p. 139, spp. nn.

Xyloterus unicolor, sp. n., *id. l. c.* p. 136, Wisconsin.

Cryphalus wapleri, Australia, *inops*, Guadeloupe, *pallidus*, Madagascar, *robustus*, ? N. America, *id. l. c.* p. 131, spp. nn.

Xylocleptes uncinatus, sp. n., *id. l. c.* p. 134, Bogota.

Pityophthorus infans, U. States, *corticalis*, Chili, *lautus*, N. America, *alienus*, Brazil, (*P.?*) *xylotrupes*, Bahia, *id. l. c.* p. 135, spp. nn.

Dryocetes (script. *Dryocetes*) *melænus*, sp. n., *id. l. c.* p. 136, Brazil.

Dryophthorus crenatus, sp. n., Fairmaire, Ann. Soc. Ent. Fr. (5) i. p. 55, Madagascar.

Tomicus amitinus, Schleusingen, and *omissus*, Neustadt-Eberswalde: Eichhoff, *l. c.* p. 138, spp. nn.

BRENTHIDÆ.

Calodromus walbergi, sp. n., Fähræus, Æfv. Sv. Ak. xxviii. p. 433, Caffraria.

Amorphocephalus imitator, sp. n., *id. l. c.* p. 434, Caffraria.

Symmorphocerus monticola, sp. n., *id. ibid.*, Caffraria.

Brenthus coquereli, Fairmaire, Ann. Soc. Ent. Fr. (5) i. p. 43, Nossi-Bé;

B. vittipennis, Fähræus, *l. c.* p. 435, Caffraria: spp. nn.

ANTHRIBIDÆ.

Sexual characters in *Nessiara* and *Cedus* are pointed out by Pascoe, Ann. N. H. (4) viii. pp. 359 & 360: *N. planata*, Pasc., is a *Phleops*.

Cratoparis lunatus, F. The larva of this sp., bred from fungi, has six conspicuous thoracic legs: Riley, iii. Rep. Ins. Mo. p. 10, note.

Philes, g. n., Pascoe, *l. c.* p. 360. Differs from *Plintheria* by its rostrum being keeled in the middle, the loose articulation of its antennal club, its oblong eyes, shorter and dilated tarsi, &c. *P. xanthodactylus*, sp. n., *id. ibid.* pl. xiv. f. 4, Fiji I.

Anthrribidus, g. n., Fähræus, *l. c.* p. 441: this and the next allied to *Anthrribus*. *A. natalensis* and *caffer*, *id. l. c.* p. 442, Caffraria, spp. nn.

Paramesus, g. n., *id. l. c.* p. 443. *P. lituratus*, sp. n., *id. ibid.*, Caffraria.

Phleotragus viator, p. 436, *varicornis*, p. 437, Caffraria: *id. l. c.*, spp. nn.

Nessiara histrio, sp. n., Pascoe, *l. c.* p. 359, pl. xiv. f. 2, Philippines.

Ecechesops 4-tuberculatus, sp. n., Fähræus, *l. c.* p. 438, Caffraria (? = *Zygænodes monstrosus*, Pasc., sec. auct.).

Habrisus heros, sp. n., Pascoe, *l. c.* f. 5, Labuan.

Phaulimia schaumii, sp. n., *id. l. c.* p. 360, Ceylon.

Xylinades rugicollis, sp. n., Fähræus, *l. c.* p. 439, Caffraria.

Chirotenon longimanus, sp. n., *id. l. c.* p. 440, Caffraria.

Phleobius pustulosus, sp. n., Gerstæcker, *l. c.* p. 76, See Jipe.

Cratoparis fasciculosus, sp. n., Fähræus, *l. c.* p. 441, Caffraria.

Aræocerus seminarius, sp. n., Chevrolat, Ann. Ent. Belg. xiv. p. 7, pl. i. f. 3 (bred from exotic grain).

Notioxenus ferrugineus, sp. n., Wollaston, Ann. N. H. (4) viii. p. 405, St. Helena.

Homœodera coriacea, sp. n., *id. l. c.* p. 406, St. Helena.

BRUCHIDÆ.

Chevrolat (Ann. Ent. Belg. xiv. p. 6) gives a short list of exotic spp. bred from grain in Europe.

Urodon rufipes, F., is recorded as British by Sharp: Ent. M. M. viii. p. 84.

Bruchus lentis and *pisi*: Künstler (Verh. z.-b. Wien, xxi. Beih. pp. 34 & 35) discusses injuries to cultivated plants from these spp.

Bruchus pisi and *granarius*: Riley (iii. Rep. Ins. Mo. pp. 44-52, figs. 15-18) describes their economy in America, and figures their chief stages.

Bruchus rufimanus: for account of damage, cf. Ent. v. p. 247.

Bruchus canus occurs on *Onobrychis sativa*: Champion, Ent. M. M. viii. p. 84.

Bruchus breweri, Crotch (*subellipticus*, Woll.) = *irresectus*, Sch.: Wollaston, Tr. E. Soc. 1871, p. 275.

Bruchus chevrolati, All., = *saundersi*, Jekel: Chevrolat, l. c. p. 8.

Spermophagus interstitialis, Brazil, from seed of *Hymenæa rugosa*, *S. gossypii*, Natal, from seed of dwarf cotton, *id. ibid.*; *S. lugubris* and *tristis*, p. 444, *divergens*, *natalensis*, *maurus*, p. 445, Caffraria, Fähræus, l. c.: spp. nn.

Bruchus innocuus and *alternans*, p. 446, *hinnulus*, p. 447, *caffer*, *decoratus*, p. 448, *quadrisignatus*, p. 449, (*Caryoborus*) *interstinctus* and *conformis*, p. 450, *id. l. c.*, Caffraria; *B. fabæ*, Riley, l. c. pp. 52-56, f. 19, U. S. A.: spp. nn.

Pachymerus lineola, sp. n., Chevrolat, l. c. p. 7, pl. i. f. 4, Brazil, from seed of *Hymenæa rugosa*.

CERAMBYCIDÆ.

Pettitt, Canad. Ent. iii. p. 105, enumerates various species from Ontario, some of which are first recorded by him as Canadian.

Prionides.

Parandra: Dohrn (S. E. Z. xxxii. p. 24) notes the occurrence upon a Brazilian sp. (? *glabra*, Deg.) of great numbers of *Gamasus giganteus*, Dug. (Acar.), and of much smaller individuals, queried as specifically distinct, or as descendants of the larger parasite.

Teledapus, g. n., Pascoe, Ann. N. H. (4) viii. p. 268. Is to be considered as representing a distinct "subfamily," most allied to the *Dynamostides*, but having conical anterior coxæ, of which the acetabula are open behind. *T. dorcadoides*, sp. n., *id. l. c.* p. 269, pl. xiii. f. 1, Mussooree, Himalaya.

Brephilydia, g. n., *id. l. c.* p. 269. Belongs to the *Remphanides*, differing from *Eurynassa* in its smooth tibiæ, of which the four anterior are externally spinose, and in its non-granulated abdomen. *B. (Mallodon) jejunum*, Pascoe, pl. xiii. f. 6.

Cantharoctenus insignis, sp. n., Gerstäcker, Arch. f. Nat. xxxvii. p. 76, Endara.

Mallaspis præcellens, sp. n., Bates, Tr. E. Soc. 1871, p. 376, Chiriqui, Panamá.

Cerambycides.

Cerambyx intricatus, Fairm., = *carinatus*, Kust., = *welensi*, Kust.; *thirki*, Kust., = *dux*, Fald.; *Callidium humerale*, Com., = *glabratum*, Charp.: de Marseul, Nouv. et faits, p. lxxxiii.

Elaphidion putator, Peck (*villosus*, F.), "the Apple-tree Pruner": particulars of the economy, &c., of this sp. are given, with figures, in i. Rep. Ins. Ont. p. 75, under the erroneous generic name *Stenocerus* (*Anthribidæ*).

Hesperophanes guttaticollis, Fairm., = *Arhopalus ambiguus*, Newm., = *Callidium vile*, Newm., = *Diatomocephala maculaticollis*, Blanch., = *D. simplex*, Gyll.: Gerstäcker, l. c. p. 77.

Rhagium mordax: Krause (S. E. Z. xxxii. p. 136) notes a deformity with

right middle leg bearing two tarsi, the inner one having a claw-joint, and parts of the limb being unduly thickened.

Rhagium bifasciatum: Weyers (Ann. Ent. Belg. xiv. c.-r. p. xxix) records a curious var.

Toxotus sericeus, Guér., is probably a *Sagridola*, if not identical with *Artelida crinipes*, Thoms.: Fairmaire, Ann. Soc. Ent. Fr. (5) i. p. 77.

Strangalia (*Stemura*) *oxyptera*, Fald., = *jægeri*, Hlum., ♂: Ballion, Bull. Mosc. xliii. p. 272.

Callidium hungaricum: Abeille de Perrin (Nouv. et faits, p. lxxvii) refers to the prevalence of this sp. in all white-wood trees of the Hautes Alps, and (p. lxxix) considers his *C. spinicorne* to replace *femoratum* in S. France.

Clytus bellieri, Gaut., = *ramni*, Germ.: des Loges, Ann. Soc. Ent. Fr. (5) i. Bull. p. lxxv.

Euryscelis suturalis: a var. of this American sp. is recorded from Rheims, bred from exotic wood used in dyeing: *ibid.* p. lxxvii.

Vesperus xatarti. Mulsant and Lichtenstein (Ann. Soc. L. Lyon, xviii. pp. 306-310) give a history of the economy of this species. The larva is said to depart from the known habits of all other Longicorns in living underground, devouring the roots of vegetables: Lichtenstein, Ann. Soc. Ent. Fr. (5) i. Bull. p. lxxix. Laboulbène (*ibid.* p. lxxxix) remarks that the larvæ of other Longicorns live on roots, and that such a habit is probably general in *Dorcadion*: cf. also Deyrolle, Pet. Nouv. p. 167.

New genera and species:—

Bolbotritus, H. W. Bates, Tr. E. Soc. 1871, p. 375 (Sect. A, div. I. *Ceramby.* *vr.*, Lac.). With very short antennæ, of which the bulbous 3rd joint is enormously enlarged. *B. bainesi*, *id. ibid.*, R. Mungwe, S.E. Africa.

Malthæba, Pascoe, Ann. N. H. (4) viii. p. 270 (*Neostenides*). With a soft abdomen and thin membranous elytra, like *Vesperus*; prothorax spined. *M. flexilis*, *id. l. c.* p. 271, W. Australia.

Simocrysa, Pascoe, *l. c.* p. 272 (*Pterostenides*). Differs from *Aphiorhynchus* in the comparatively shorter antennæ and femora, and from *Demonisis* by the length of its muzzle and the non-approximation of the antennæ to the eyes (pl. xiii. f. 7). *S. discolor*, *id. ibid.*, K. G. Sound.

Phyodexia, Pascoe, *l. c.* p. 273 (*Mythodides*). Strikingly dissimilar in habit and many points of structure to the other 2 genera of the group. *P. concinna*, *id. ibid.* pl. xiii. f. 2, Mussooree, Himalaya.

Ochyra, Pascoe, *l. c.* p. 273. To be placed in a new "subfamily," approaching *Zoedia* in prothorax and elytra and following the *Aphneopides*. Facies of *Euderces* (*Tillomorphides*). *O. coarctata*, *id. l. c.* p. 274, pl. xiii. f. 3, Mt. Wellington, Tasmania.

Anomoderus, Fairmaire, *l. c.* p. 59 (*Molorchides*). Very near *Brachypteroma*: thorax 4 times as long as head, strongly constricted in the middle. *A. coquereli*, *id. l. c.* p. 60, Madagascar.

Thaumasocerus [*rectius* *Thaumasi*-, *Thaumast*-, *vel* *Thaumatocerus*], *id. l. c.* p. 61 (*Glaucyptides*). Very near *Iresioides*, Thoms., but with the 3rd, 4th, and 5th joints of the antennæ (♂) strongly dilated and compressed, shorter palpi, and very elongate thorax. (The author indicates at p. 63 a belief that *Iresioides* is not well founded generically, and also that it and *Thaumasocerus* could well be associated with *Glaucytes*.) *T. platycerus*, *id. ibid.*, Madagascar.

Pachydissus sartus, Solsky, Hor. Ent. Ross. viii. p. 150, T. v. f. 4, Samarcand.

Hesperophanes liturifer, Walker, List Col. Lord, p. 18, Harkeko.

Phacodes tenuitarsis, Nicol Bay, W. Austr., *longicollis*, Wide Bay, Queensland, Pascoe, l. c. p. 270.

Anisogaster myrmido, Fairmaire, l. c. p. 60, I. Mayotte, Comores.

Syllitus terminatus and *tabidus*, Pascoe, l. c. p. 271, Nicol Bay, W. Austr.

Aphiorhynchus divisus, id. *ibid.*, Rockhampton, Queensland.

Macrones subclavatus, id. l. c. p. 272, Sydney.

Tachyta tuberculicollis, Blanchard, C. R. lxxii. p. 812, note, Thibet (diagn. only).

Strangalia dichroa, *arcifera*, *zonifer*, *thibetana*, id. *ibid.*, Thibet (do.).

Earinis picta, Pascoe, l. c. p. 273, New S. Wales.

Compsonera fenestrata, Gerstäcker, l. c. p. 77, Endara.

Rhopalizus sansibaricus, id. *ibid.*, Zanzibar.

Callidium verneti, Pellet, Mém. Soc. Ac. Pyr. Or., & Pet. Nouv. p. 164, Vernet-les-bains [most probably = *Sympiezocera laurasi*, Luc., teste De Marscul, Nouv. et faits, p. lxxxix. The latter species is indicated with some doubt, l. c. p. xcvi, as having been taken near Paris; cf. also Ann. Soc. Ent. Fr. (5) i. Bull. p. lvii & lxxvii, where it is proved to be indigenous to France. Deyrolle (Pet. Nouv. p. 151) records capture of this sp. by Marmottan at Fontainebleau, and dubiously refers it to *Callidium* (*Semanotus*) *ligneum*, F., an American insect. He afterwards (p. 160) retracts this opinion, and (p. 164) corroborates the identity of the insect with *S. laurasi*, recording its capture by Bonvouloir at Auteuil, and by Bellier de la Chavignerie in Corsica; *C. subcostatum*, Fairmaire, l. c. p. 57, Madagascar.

Xylotrechus coquereli and *prolixus*, id. l. c. pp. 58 & 59, Madagascar.

Epipedocera perelegans, v. Vollenhoven, Tijdschr. Ent. (2) vi. p. 104, pl. 4. f. 4, Timor.

Glaucytes (? *Iresioides*) *lineaticollis*, p. 62, *ferax*, p. 63, Madagascar: Fairmaire, l. c.

Euryphagus [*Eurycephalus*] *wieneri*, v. Vollenhoven, l. c. p. 105, pl. 4. f. 5, Timor (? = *maxillosus*, Ol., ♀, sec. auct.).

Purpurizenus fettingi, Portugal, *nicocles* (? = *dalmatinus*, St., var. sec. auct.), Cyprus, p. 209, *bilineatus*, Cyprus, *brasiliensis*, Brazil, p. 210, Schaufuss, Nunq. Ot. i.; *P. haussknechti* and var. *aleppensis*, Witte, B. E. Z. xv. p. 207, Kurdistan and Aleppo.

Tragocerus heraldicus, v. Vollenhoven, l. c. p. 106, pl. 4. f. 6, New Guinea.

Distenia fastuosa, Pascoe, l. c. p. 274, Nicaragua.

Melegena cyanea, id. l. c. p. 275, Cochin China.

Lamiides.

MURRAY, in a further instalment of his "List of Coleoptera received from Old Calabar, on the West Coast of Africa," Ann. N. H. (4) vii. pp. 38-51 (continued from vi. p. 482), further discusses the *Lamiades* known to him from that region. He recharacterizes and comments upon the affinities &c. of *Tecton* and *Prosopocera*, redescribing *T. quadrisignatum*, *P. ocellata*, *myops*, *dorsalis*, and (? *P.*) *pictiventris*, *Geloharpyia murrayi*, *Tragocephala*

galathea, *senatoria*, *chloris*, *signaticornis*, and *jaguarita*, and *Acrydocephala bistriata*, Chevr. The references are to plates ii. & iii. of vol. vi.

Plectrura producta, Lec., = *spinicauda*, (Esch.) Mann.: Schaufuss, *l. c.* p. 160.

Dorcadion: Kraatz (B. E. Z. xv. pp. 194–204) refers to the nomenclature &c. of the German spp., especially as to *arenarium*, Scop. (*pedestre*, F.), and its varr. *D. mendax* and *meridionale* are not varr. of *fuliginator*, though *nava-ricum* and *monticola* possibly may be varr. of *meridionale*: des Loges, Mitth. schw. ent. Ges. iii. p. 376.

Batocerides: v. Vollenhoven, *l. c.* pp. 211–220, pl. 9, enumerates, with localities and bibliographical references, the spp. of this group in the Leyden Museum. Amongst others, the following observations are made by him: *Batocera pulverosa*, Pasc., is not improbably identical with, or a local var. of, *wienercki*, Kaup; *catenata*, de H., ? = *lineolata*, Chevr. (*chinensis*, Thoms.); *celebiana*, Thoms., is altered to *celebensis*; *stigma*, Voet, *albofasciata*, de G., = *8-maculata*, F.; and two possibly new spp. of *Apriona*, from Dorey and Tondano, are indicated and figured (pl. 9. figs. 4 & 5). The spine of basal joint of ant. tarsus in ♂ of *armata*, Ol., is also figured, *ib.* f. 1.

Megacriodes, Pasc.: v. Vollenhoven, *l. c.* p. 110, on account of the ♂ of any member of this genus being unknown, doubts its distinctness from *Batocera*; he figures (pl. 5. figs. 11, α , β , & γ) the thorax of *M. ebeninus*, and portions of the antennæ of *Megacriodes*, *Batocera*, and *Apriona*.

Zygocera lugubris, Pasc., = *canosa*, Er.: Pascoe, Ann. N. H. (4) viii. p. 276.

Saperda geminata, Kl., is referred to *Oopsis* by Fairmaire, *l. c.* p. 74.

Astynomus ædilis: for note of the occurrence of this insect alive in Paris, cf. Ann. Soc. Ent. Fr. (4) x. Bull. p. lxxxiii.

Saperda populnea: Giraud, *ibid.* (5) i. p. 408, records *Ephialtes tuberculatus*, Fourc., *Cryptus analis*, and *Echthrus nubeculatus*, Gr. (the latter from *Populus alba*), and a new sp., *E. populneus* (from *P. tremula*), as Ichneumons parasitic upon this sp.

Saperda bivittata, "the two-striped Borer": particulars of economy &c. given, with figure, in i. Rep. Ins. Ont. p. 69.

Oberea linearis: Künstler (Verh. z.-b. Wien, xxi. Beih. p. 65) discusses injuries to cultivated plants from this sp.

New genera and species:—

Madecops, Fairmaire, Ann. Soc. Ent. Fr. (5) i. p. 70 (*Mesosides*). Allied to *Coptops*, but with wider head, long and rather slender antennæ, less-cylindrical thorax, rather long elytra, which are attenuate at the apex, and conic mesosternum. *M. pruinatus*, *id. ibid.*, I. Mayotte, Comores.

Tragon, Murray, *l. c.* p. 49 (*Tragocephalides*). Indicated as a new genus or subgenus for *Tragocephala signaticornis* and *jaguarita*, Chevr.

Scotinauges, Pascoe, *l. c.* p. 277 (*Hebesecides*). Scape short, femora linear, anterior portion of mesosternum with vertical edge. *S. diphysis*, *id. ibid.* pl. xiii. f. 4, Japan.

Phoryctus, Gerstäcker, *l. c.* p. 78 (*Apomecynides*). *P. mucoreus*, *id. ibid.*, Mombas.

Ægoprepes, Pascoe, *l. c.* Forms a new subfamily, between the *Hip-*

popsides and *Ectatosiides*, approaching the former by its very short legs, more quadrate face, and the form of its pro- and mesosterna: antennæ short, joints 1, 3, & 4 elongate, and, with 2, densely pilose, the rest short and cylindrical. *Æ. antennator*, *id. l. c.* p. 278, pl. xiii. f. 5, Malacca.

Tmesisternus isabella, v. Vollenhoven, *l. c.* p. 107, pl. 4. f. 7, Salawatti.

Temnosternus [*? rectius Tmetosternus vel Sternotomus*] *vitulus*, Pascoe, *l. c.* p. 275, Queensland.

Leprodera felderi, v. Vollenhoven, *l. c.* p. 109, pl. 5. f. 9, Sumatra.

Batocera obliqua, pp. 215 & 219, pl. 9. f. 2, Bourou; *irregularis*, *ibid.* pp. 216 & 220, pl. 9. f. 3, Celebes and Sangir (intermediate between *Batocera* and *Apriona*): *id. l. c.*

Megacriodes guttatus, *id. l. c.* pl. 5. f. 10 & 10 a, Sumatra (*? = ♀ of a sp. o Batocera* described by Kaup, *sec. auct.*).

P[r]otemnemus rosenbergi, *id. l. c.* p. 108, pl. 4. f. 8, Dorey.

Mesosa stictica, Blanchard, C. R. lxxii. p. 812, note (diagn. only), Thibet.

Coptops chloroticus, Madagascar, *nigropunctatus*, I. Mayotte, Comores, p. 68, *humerosus*, p. 69, Mahé, Sechelles: Fairmaire, *l. c.*

Ancylonotus nasicornis, Pascoe, *l. c.* p. 275, Sierra Leone.

Prosopocera frii, Murray, *l. c.* p. 42, Old Calabar.

Phyma[to]sterna sexpunctata and *vagepicta*, Nossi-Bé, *distincta*, Madagascar: Fairmaire, *l. c.* p. 65.

Disterna mastersi, Pascoe, *l. c.* p. 276, Queensland.

Frea marmorata, Gerstäcker, *l. c.* p. 78, Mbaramu.

Crossotus barbarus, *id. ibid.*, See Jipe.

Niphona appendiculata, *id. ibid.*, See Jipe.

Praonetha scripta, *id. l. c.* p. 79, Endara; *P. obsoleta*, Fairmaire, *l. c.* p. 67, I. Mayotte, Comores.

Oopsis ephippiata, p. 72, *nervosa*, p. 73, I. Mayotte. Comores; *guttulata*, *ibid.*, Madagascar: *id. l. c.*

Pothyne silacca, Pascoe, *l. c.* p. 278, Nagasaki.

Euthyorus protensus, *id. ibid.* pl. xiii. f. 8, Mexico.

Hippopsicon virgatum and *rusticum*, Gerstäcker, *l. c.* p. 79, See Jipe.

Hippopsis quadricollis, Fairmaire, *l. c.* p. 75, I. Mahé, Séchelles.

Tetraglenes phantoma, Gerstäcker, *l. c.* p. 79, Zanzibar.

Conizonia elegantula and *heterogyna*, Fairmaire, *l. c.* (4) x. p. 402, Lam-bessa.

Blepisanis (recharacterized) *porosa* and *fervida*, p. 270, *incensa*, *larvata*, *suturalis*, *exilis*, *collaris*, p. 280, Natal: Pascoe, *l. c.*

CHRYSOMELIDÆ.

Sagrides.

Duboulaia, g. n., Baly, Tr. E. Soc. 1871, p. 381. Between *Megamerus* and *Prionesthis*, differing from the former in its shorter head and antennæ, less prominent eyes, and the ovate and apically obtuse terminal joint of its maxillary palpi, and from the latter in the form of its thorax and in its spined posterior femora. *D. fulvipennis*, sp. n., *id. l. c.* p. 382, W. Australia.

Carpophagus excavatus, sp. n., *id. ibid.*, W. Australia.

Donaciïdes.

Donacia crassipes: Bellevoye (Nouv. et faits, p. lxxiv) notes its earlier

stages, in connexion with *Nymphæa lutea*; the larva lives submerged, as in *Hæmonia*. He also, in like manner, mentions *D. videns* in connexion with *Potamogiton nutans*.

Hæmonia: Bellevoye's observations upon the earlier stages in this genus are recapitulated in *Nouv. et faits*, pp. lxviii & xc.

Donacia viridula, sp. n., J. Sahlberg, *Not. Fenn.* xi. p. 438, Lapland.

Criocerides.

Crioceris asparagi and *12-punctata*, *Lema cyanella* and *melanopa*: Künstler (*Verh. z.-b. Wien*, xxi. Beih. pp. 56 & 15) discusses injuries to cultivated plants from these spp.

Crioceris alpina: Abeille de Perrin (*Nouv. et faits*, p. lxvii) refers to the universal damage to Martagon lilies on the French Hautes-Alpes caused by larvæ of this species.

Zeugophora rufotestacea, sp. n., Kraatz, *B. E. Z.* xv. p. 162, E. Prussia [= *turneri*, Power, 1863].

Lema foveicollis, *morosa*, and *nigriventris*, Gerstäcker, *Arch. f. Nat.* xxxvii. p. 79, Zanzibar: spp. nn.

Clythrines.

Coptocephala peregrina, Muls. & Rey, is now referred to *Somoplatus* by its authors: *Ann. Soc. L. Lyon*, xviii. p. 105 (*Op. Ent.* xiv. p. 129).

Titubæa 10-guttata, sp. n., Walker, *List Col. Lord*, p. 18, Cairo.

Diapromorpha hæmorrhagica, sp. n., Gerstäcker, *l. c.* p. 80, Zanzibar.

Gynandrophthalma asphaltina and *amænula*, *id. ibid.*, Zanzibar: spp. nn.

Damia (?) *confusa*, sp. n., *id. ibid.*, Zanzibar.

Som[ati]oplatus fulvus, sp. n., Mulsant & Rey, *l. c.* p. 104 (*Op.* p. 128), Marseilles, imported.

Eumolpides.

Colaspis suilla, F., *flavida*, Say, = *brunnea*, F., according to Riley (*iii. Rep. Ins. Mo.* p. 82, note), who figures the imago, *l. c.* p. 81, f. 37, and describes (p. 84) and figures its larva (f. 38), which closely resembles that of a Lamellicorn beetle, and lives at the roots of strawberry-plants, unlike the blackish glabrous larva of the European *Colaspis barbara* [*Colaphus ater*, Ol.], which is found on leaves of clover.

Eumolpus [*Bromius*] *vitis*: Künstler, *l. c.* p. 87, discusses injuries to cultivated plants from this sp.

Pseudocolaspis: Schaufuss (*Nunq. Ot. i.* pp. 197-204) recharacterizes and revises this genus, describing under the name *curculionides*, Dej., a sp. from Senegal, probably erroneously referred by that author to *cærulea*, Lap.

Colaspidea v-globosum, Küst., = *æruginea*, F.; *v-oblongum*, Blanch., *v-proximum*, Fairm., = *nitida*, Luc.: des Loges, *Mitth. schw. ent. Ges.* iii. p. 359.

Ecranus [also script. *Ecranes*] g. n., Walker, *List Col. Lord*, p. 19 [no differential characters given]. *E. nigripes*, sp. n., *id. ibid.*, Hor Tamanib.

Pachnephorus conspersus, Gerstäcker, *l. c.* p. 81, Wanga; *P. hipponensis*, des Loges, *l. c.* p. 358, Bone; *P.* (script. *Pachnophones*) *æneus*, Walker, *l. c.*, Harkeko: spp. nn.

Scelodonta sansibarica, sp. n., Gerstäcker, *l. c.*, Zanzibar.

Pseudocolaspis chrysites, *id. l. c.*, Zanzibar; *P. bipilosa*, p. 200, *obscura*, p. 201, *tibialis*, p. 203, New Germany, Caffraria, *cribrata*, p. 200, Hongkong, *diversicolor*, Cyprus, *variabilis*, Antioch, p. 202; *servula*, C. G. Hope, *humeralis* and varr. *cyanea* and *violaceicollis*, ? Asia Minor, p. 203, Schaufuss, *l. c.*: spp. nn.

Rhypparida collaris and *cyanipennis*, p. 81, *micans*, *trivialis*, and *obscura*, p. 82, Zanzibar: Gerstäcker, *l. c.*, spp. nn.

Colasp[ido]soma subcostatum, Zanzibar, *compactum*, Mombas: *id. l. c.* p. 82, spp. nn.

Colaspidea abbreviata, sp. n., des Loges, *l. c.*, Spain.

Cryptocephalides.

TAPPESS, Ann. Soc. Ent. Fr. (5) i. pp. 253-270, continues his paper on the "Cryptocéphalides d'Europe et des pays limitrophes" (pt. 1, *l. c.* 1869, p. 5). *C. maculicollis*, Muls., nec Waltl, is renamed *reyi*, and figured, pl. 3. f. 1, Waltl's sp. being fig. 2 on the same plate: *undatus*, Suffr., nec Ol., is renamed *phaleratus* (*ibid.* figs. 3-3b); both sexes of *macroductylus*, Gebler, apparently a *Protophysus*, are figured (*ibid.* 4 & 5), and also of *podager*, Seidl., with details (*ibid.* 6-9).

Cryptocephalus cribratus, Suffr.: the author (S. E. Z. xxxii. p. 24) re-describes this sp., with which he has confused another which he considers undescribed. Kraatz (*ibid.* p. 268) adds to the characters given by Suffrian.

Stylosomus constrictus, Schauf., = *ericeti*, Kies.: Schaufuss, Nunq. Ot. i. p. 160.

Lachnobothra, Saund., is entitled to generic rank, and *Chlamys* (?) *brac[t]eata*, Klug, is to be referred to it; it is recharacterized from the ♂: Baly, Tr. E. Soc. 1871, p. 391.

Cryptocephalus bidens, Suffrian, *l. c.*, Asia Minor (= *tappesi*, Mars.: Kraatz, *ibid.* p. 269); *C. princeps*, Rottenberg, B. E. Z. xv. p. 248, T. viii. f. 4, Naples; *C. opacus*, p. 264, Daouria, *trapezensis*, p. 266, Trebizond, Tappes, *l. c.*; *C. tabidus*, p. 80, *kersteni* and *apertus*, p. 81, Zanzibar, Gerstäcker, *l. c.*: spp. nn.

Pachybrachys israelita, sp. n., Tappes, *l. c.* p. 267, Palestine.

Elaphodes albohirsutus, sp. n., Baly, *l. c.* p. 383, W. Australia.

Ditropidus carbonarius and *hirticollis*, p. 384, *duboulayi* and *strigosus*, p. 385, *rufocypreus*, p. 386, *tarsatus*, p. 387, *fulvus*, p. 388, *fasciatus*, p. 390, W. Australia; *odevahni*, p. 387, S. Australia; *dimidiatus*, N. Australia, *biplagiatus*, N. W. Australia, p. 389: *id. l. c.*, spp. nn.

Lachnobothra breweri, p. 393, K. George's Sound; *integra*, p. 394, *wilsoni*, p. 395, *waterhousii*, p. 396 (p = *brac[t]eata*, Kl., *sec. auct., teste* Baly), S. Australia; *saundersi*, p. 397, Australia; *distincta*, p. 398, N. W. Australia; *duboulayi*, p. 399, W. Australia: *id. l. c.*, spp. nn.

Chrysomelides.

VOGEL (Nunq. Ot. i. pp. 81-156) completes his revision of the Central and South African spp., characterizing 2 new genera and 45 new species. The following observations occur:—*Chrysomela opulenta*, Reiche, being preoccupied, is named *reichii*; *limbolata*, Reche., = *americana*, L., var.; *Polysticta subcruciata*, Clark, = *pardalina*, F., var.; *20-guttata*, Cllk., = *20-pustulata*, Thunb.; *20-*

maculata, Clk., nec Chev., is named *vicenaria*; *figurata*, Clk., nec Germ., is named *varivestis*; *nigra*, Clk., = *pulla*, Swartz; *nigrosignata*, Clk., nec Stål, is named *aspergata*, and *confluens*, Gerst., is a var. of it; *eburnipennis*, Clk., ? = *liturata*, Swartz; *hebe*, Clk., nec Baly, is named *lynx*; *picturata*, *lineolata*, *nigrofasciata*, and *pulchella*, Clk., *cribrosa*, Thunb., = *fasciata*, Deg., varr.; *soluta*, Clk., = *6-lineata*, Thunb. *Plagiodera trimeni*, Baly, = *æthiopica*, Thunb.; *viridivittata*, Baly, = *submarginata*, F.; exception is taken to Lacordaire's statement, that the 3rd joint of the tarsi is entire, and the claws simple in the *Chrysomelides*, with very rare exceptions, and reasons are given for associating *Ceralces* with them instead of with the *Eumolpides*; *Pseudomela murrayi*, Baly, ? = *Ceralces ferrugineus*, Gerst.

Doryphora 10-lineata. Saunders and Reed (Canad. Ent. iii. pp. 41-51) report on the ravages of this beetle in Ontario, and the means of destroying it, with figs. of parasites, &c.: as to its occurrence in Michigan, cf. Tenney, Am. Nat. v. p. 170.

Chrysomela distinguenda, Steph.: Keeley, Ent. M. M. viii. p. 15, notes occurrence of this insect near London.

Lina lapponica and *Chrysomela fucata*: Krause (S. E. Z. xxxiv. pp. 136 & 137) records a monstrosity of the former with its right elytron having 5 small reddish spots, the left being narrowly margined laterally with reddish brown; and of the latter, with its thorax cleft in the middle like a hare-lip.

Entomoscelis adonidis and *Gonioctena 6-punctata*: Künstler (Verh. z.-b. Wien, xxi. Beih. pp. 45 & 58) discusses injuries to cultivated plants from these spp.

Prasocuris phellandrii. Its early stages, on *Ænanthe phellandrium*, are mentioned by Bellevoye: Nouv. et faits, p. lxxiv.

Xiphomela, g. n., Vogel, l. c. p. 81. Tibiæ lamelliform, bimucronate at the apex. *X. javeti*, sp. n., *id. ibid.*, Old Calabar.

Centroscelis, g. n., *id. l. c.* p. 125. Allied to *Trochalonota* and *Phytodecta* by its triangularly dilated tibiæ, but dilatation equal for lowest third; claws dentate, punctuation confused. *C. (Chrys.) notata*, F. (type), *macularis*, Clark (*Polyst.*), and *C. inenarrabilis*, p. 127, *bisquinquepustulata*, p. 130, *trifibulata*, p. 131, C. G. Hope, *melanaspis*, Pt. Natal, spp. nn.; also *Polysticta* [preoccupied in *Aves*] *lævigata* (*Gonioctena murrayi*, Baly) and *nigrocænea*, Clk., which are referred as varr. to a sp. named *polychroma*.

Strumatophyma [*vox hybrida*; *struma*, gen. -æ, being Latin], g. n., Baly, Tr. E. Soc. 1871, p. 400. Separated from *Chalcolampra* by its apterous body, soldered elytra, and simple claws. *S. (C.) verrucosa* and *undulatipennis*, Clk.

Sphærolina, g. n., *id. ibid.* Distinguished from *Chrysomela* by its short antennæ and form of thorax, and from *Lina* by its shorter form and swollen elytra. *S. (Lina) rajah*, Guér., and *templetoni*, Baly.

Cyrtomus coruscans, sp. n., Vuillefroy, L'Ab. v. p. 295, Portalegre [omitted from Zool. Rec. v.].

Chrysomela (sens. str.) *obesa*, p. 84, Guinea, Natal; *gabonensis*, p. 85, Gaboon; *badeni*, p. 87, *heptas*, p. 88, *præstans*, p. 89, *achillis* and *alutacea*, p. 90, *nugaria* and *perlustrata*, p. 91, *levis*, p. 93, *simpliciuscula*, p. 94, C. G. Hope; *electoralis*, p. 87, *natalensis*, p. 88, *observanda*, p. 90, *melancholica*, p. 94, *triloris*, p. 95, Pt. Natal; *suppleta* and *propinqua*, p. 92, *sævorum*, p. 93, *plagioderoides*, p. 95, Caffraria; *C. (Polysticta) palliata*, p. 102, *dissoluta*, p. 103, *progressa*, p. 105, *problematica*, p. 107, *polyops*, p. 111, *vulpecula*, p. 112, *mar-*

pinipicta, p. 113, *haagi*, p. 115, *catenata*, p. 117, *tetraspilota*, p. 121, *lineoligera*, p. 123, C. G. Hope; *figurata*, p. 107, Pt. Natal; *tricolor*, p. 118, *tæniolata*, p. 119, Caffraria, Vogel, l. c.: *C. dierythra*, Rottenberg, B. E. Z. xv. p. 243, Sicily: spp. nn.

Plagiodera peripherica, p. 133, C. G. Hope, *circumcincta*, *ibid.*, S. Africa, *impolita*, p. 134, Caffraria, Zanzibar, *madagascariensis*, p. 138, note, Madagascar, Vogel, l. c.; *P. impolita*, Gerstäcker, l. c. p. 82, See Jipe: spp. nn.

Prasocuris rubiginosa and *nana*, Vogel, l. c. pp. 139 & 140, C. G. Hope, spp. nn.

Galerucides.

Diabrotica vittata. Shimer (Am. Nat. v. p. 217) gives some further notes on its habits.

Galeruca calmariensis. Under this name, Pissot, Ann. Soc. Ent. Fr. (5) i. Bull. p. xxxv, records the unusually extensive ravages of a species near Paris upon elms and horse-chestnuts, the latter tree having hitherto been free from damage by insects, according to him. Fallou, Poujade, and Lichtenstein (*ibid.*) also report similar occurrences from Sénart, Lardy, and Montpellier. Chevrolat (*ibid.*) refers the insect to *cratægi*, Först., stating that the true *calmariensis* is not known as yet to occur in France.

Galeruca festiva, Gerst., = *Rhaphidopalpa vinula*, Er.: Gerstäcker, l. c. p. 84.

Adorium palliatum, sp. n., *id.* l. c. p. 83, Mombas.

Apophyllia nobilitata and *murina*, *id. ibid.*, Zanzibar, spp. nn.

Monolepta rubricosa, *didyma*, *vincta*, *vinosa*, p. 83, *ephippiata*, p. 84, Zanzibar: *id.* l. c., spp. nn.

Xenarthra calcarata, sp. n., *id.* l. c. p. 84, Zanzibar.

Malacosoma pusilla, Zanzibar, *M. (?) litura*, Mombas: *id. ibid.*, spp. nn.

Ædionychis rubiginosa, Moschi, *Æ. (?) vernicata*, Uru: *id. ibid.*, spp. nn.

Diacantha duplicata, sp. n., *id. ibid.*, Uru.

Lyperus ætnensis, sp. n., Rottenberg, B. E. Z. xv. p. 244, Sicily.

Halticides.

Haltica. Künstler, l. c. p. 41, discusses injuries to cultivated plants from spp. of this genus, especially referring (p. 40) to *Psyllodes chrysocephala*. *H. eruca*: Taschenberg, Z. ges. Naturw. xxxviii. p. 371, notes damages to oak-leaves by this species. *H. chalybea*: particulars of the economy of this vine-pest are given, with figures, in i. Rep. Ins. Ont. pp. 107 & 108. "*Haltica fuscicornis*" is recorded by Newman, Ent. v. p. 309, as being injurious to saint-foin; but, from this plant, and from the obsolete synonymy given, it is evident that *Crepidodera rufipes* is the insect intended to be designated.

Crepidodera ferruginea has been observed in cop. with *rufipes*, and also with *transversa*: Morley, Ent. M. M. viii. p. 135.

Phyllotreta pæciloceras is noted as injurious to *Chiranthus annuus* in En. v. p. 352.

Thyamis rutila and *cerina* are recorded as British, Ent. M. M. vii. pp. 206 & 207, and additional characters and fresh British localities are recorded for *T. agilis*, Rye, *ibid.* viii. p. 160, by the Recorder. *T. jacobææ*,

Waterh. (*tabida*, auct.): Moncreaff, *ibid.* p. 207, suggests a double brood of this species every year.

Orestia andalusica, sp. n., Allard, L'Ab. v. p. 476, Andalusia [omitted from Zool. Rec. v.].

Graptodera hispana, sp. n., *id.* l. c. p. 477, Spain [omitted from Zool. Rec. v.].

Haltica (*Crepidodera*) *testa*, sp. n., Gerstäcker, l. c. p. 85, Mombas.

Aphthona perrisi, sp. n., Allard, l. c. p. 477, Corsica [omitted from Zool. Rec. v.].

Haltica (*Aphthona*) *cookii*, sp. n., Gerstäcker, l. c., Zanzibar.

Argopus pusillus, sp. n., *id.* *ibid.*, See Jipe.

Longitarsus mellissi, sp. n., Wollaston, Ann. N. H. (4) viii. p. 407, St. Helena.

Psylliodes [*rectius* *Psyllodes*] *catinensis*, p. 245, *ventricosus*, p. 246, Sicily: Rottenberg, B. E. Z. xv, spp. nn.

Hispidæ.

Hispa quadrifida and *pachycera*, Gerstäcker, l. c., Zanzibar, spp. nn.

Cassidides.

Cassida nebulosa. Künstler, l. c. p. 50, discusses injuries to cultivated plants from this species. Rogenhofer (*ibid.* xxi. p. 65) also refers to it as destroying cabbages.

Cassida chloris is recorded (dubiously) as British by Sharp: Ent. M. M. viii. p. 84.

EROTYLIDÆ.

De Borre (Ann. Ent. Belg. xiv. c.-r. p. xxix) records an American sp., on the sides and abdomen of which a pedicellated cryptogamous plant was abundantly developed.

Triplax. Kraatz, B. E. Z. xvi. pp. 144 & 145, tabulates the German spp.

Tritoma bipustulata. Bedel, Ann. Soc. Ent. Fr. (5) i. Bull. p. xlv, records an entirely black var. from Meudon.

Aulacochilus, Lac. Bedel revises this genus, l. c. pp. 271-286. According to him, *Engis subrotunda*, MacL., cannot be referred correctly to *A. 4-pustulatus*, F., and is probably not in this genus; *A. propinquus*, Lac., is described from an immature example; *cuniferus*, Lac., is typogr. err. for *luniferus*, Guér.; *algerinus*, Bed., = *chevolati*, Luc.

Episcapha scenica, sp. n., Gerstäcker, l. c. p. 86, Mombas.

Triplax pygmæa, sp. n., Kraatz, l. c. p. 145, Steiermark.

Triplax (*Tritoma*) *aulica*, sp. n., Horn, Tr. Am. Ent. Soc. 1871, p. 343, Missouri.

Aulacochilus doriæ, p. 275, Borneo; *maximus*, p. 276, E. India; *tetraphacus*, p. 278, Malacca; *birmanicus*, p. 280, Birmah, Rangoon; *micans*, p. 281, Malasia (? = *janthinus*, Lac., sec. auct.); *sericeus*, p. 282, Malacca, Malasia (? = *atrocæruleus*, Mots., sec. auct.); *mediocæruleus*, p. 285, Philippines, Mindanao: Bedel, l. c., spp. nn.

Engis californica, sp. n., Horn, l. c. 1870, p. 97, California.

ENDOMYCHIDÆ.

Mycetina pallida, Colorado, *limbata*, California: *id. l. c.* p. 96, spp. nn.
Epipocus unicolor, sp. n., *id. ibid.*, Colorado, Arizona.]

COCCINELLIDÆ.

CROTCH (Cambridge, April 1871) publishes a synonymic list of all spp. of this family known to him, indicating such of them as he has been unable to see, and giving the names of the following new genera—*Euseladia* (*waterhousii*, sp. n.), *Eumegilla* (type *conterminata*, Muls.), *Neoadalia* (*t. deficiens*, Muls.), *Neoharmonia* (*t. viridipennis*, Muls.), *Anisocalvia* (*t. 14-guttata*, L.), *Euentypus* (*complicata*, sp. n.), *Neocalvia* (*t. blanchardi*, Muls.), *Neohalyzia* (*t. perroudi*, Muls.), *Palæoneda* (*t. auriculata*, Muls.), *Microneda* (*t. sicheli*, Muls.), *Dichroneda* (*funerea*, sp. n.), *Sphæroneda* (*t. sinopæ*, Muls.), *Callineda* (*t. 16-notata*, F., renamed *multipunctata*), *Heteroneda* (*t. reticulata*, F., renamed *billardi*), *Cyphocaria* (*t. duvauceli*, Muls.), *Aiolocaria* (*t. 6-spilota*, Hope), *Callicaria* (*t. superba*, Muls.), *Megalocaria* (*t. reichii*, Muls.), *Microcaria* (*t. mulsanti*, Montr.), *Cælocaria* (*t. regalis*, Ol.),—and new spp., *Micaria josephina*, *Adalia indica* and *intermedia*, *Neoadalia germani*, *Neoharmonia mexicana*, *Coccinella zelandiæ*, *Anisocalvia vishnu*, *krishna*, *buddha*, *Neocalvia anastomozans*, *Psyllobora lacteola*, *approxinata*, *Leis cerasicolor*, *aterrima*, *papuensis* and var. ? *suffusa*, *deyrollii*, *dumlopi*, *Pelina borrii*, *Neda mexicana*, *Callineda decussata*, *Cycloneda figurata*, *antillensis*, *frii*, *Caria insignis*, *Cælocaria pulchra*, *aruensis*, *formosa*, *vicina*, *Lemnia mouhoti*, *polynesia*, *Cælophora jansoni*, *wallacii*, *ripponi*, *saundersi*, *excellens*, *vividus*, *Propylea kehama*, *Pania japonica* and *malaccensis*, *Cydonia unicolor*, *isis*. The following changes of nomenclature are proposed:—*Cocc. tricusps*, Kby., to be named *kirbii*; *Psyllobora confluens*, F., to be named *varians*; *P. lineola*, F., to be named *fabricii*; *Daulis*, Muls., to be named *Cycloneda*; *C. abdominalis*, Say, to be named *saii*. Many names are deposited on account of erroneous citation or preoccupation; many spp. sunk as vars. &c.

Ritsema, Tijdschr. Ent. (2) vi. p. 150, notes the occurrence of numbers of *Coccinellidæ* on a single plant in October.

Dei (Bull. Ent. Ital. iii. pp. 197–199) enumerates various instances of copulation between *Coccinella bipunctata* and *dispar*, both type and the var. *6-pustulata*, and suggests the probability of a hybrid result from such connexion, thinking also a hybrid possible between *C. variabilis* and *C. 14-pustulata*. [The Recorder possesses a British individual, in his opinion only referable to a hybrid between the two spp. first named.] Hochhuth (Bull. Mosc. xlv. p. 208, note) records an instance of a connexion for three days between *C. bipunctata*, ♀, and *Phytonomus polygoni*, ♂ (*Curculionidæ*), from which it would seem that the *Coccinellidæ* occasionally act as the “Hetæra” of the *Coleoptera*.

Schaufuss (Nunq. Ot. i. p. 160) points out localities for *Coccinella withii* and *Scymnus albipes*, Mls., and *S. marginicollis*, Man. He also repeats (p. 205 *et seq.*) the diagnoses of his *Mysia vogeli* and *mulsanti* (hinting his present belief that they are only varr. of *oblongoguttata*), *Thea flaviventris* (= *27-punctata*, Mots.), *Coccinella inconstans*, *clathrata*, and *lutea* (admitted now possibly to be three forms of one “race”—? of *variabilis*).

Mysia 15-punctata is described as attacking the larvæ of the Colorado Potato-beetle in Ontario by Reed (Canad. Ent. iii. p. 169), who figures its principal varr. &c (f. 35).

Halysia hyperborea. J. Sahlberg (Not. Fenn. xi. p. 440) briefly records two Lapland varr. of this sp.

Chilocorus ruficeps, Muls., = *distigma*, Klug; *Epilachna distincta*, Er., = *punctipennis*, Muls.: Gerstäcker, l. c. p. 346.

Epilachna globosa. Künstler, l. c. p. 57, discusses injuries to cultivated plants from this sp.

New genus and species :—

Microthybus, Gerstäcker, l. c. p. 348. Allied to *Chnooda* and *Exoplectra*, Muls. *M. (Cocc.) mesomela*, Klug; *rufipennis*, Gerst. *ibid.*, Zanzibar.

Coccinella quatuordecimplagiata, Ballion, Bull. Mosc. xliii. p. 353, Turkestan.

Cleothera brucki, pretiosa, p. 321, ponderosa, venalis, p. 322, proserpinæ, pedicata, p. 323, flavida, gemellata, septenaria, p. 324, vaticina, circæa, p. 325, laqueata, maisonni, subparallela, p. 326, Colombia: Mulsant, Ann. Soc. L. Lyon, xviii.

Alesia aurora, p. 345, Uru, amænula, p. 346, Zanzibar: Gerstäcker, l. c.

Thea imbecilla, *id.* l. c. p. 345, Zanzibar.

Chilomenes (?) *pardalina*, *id.* l. c. p. 346, See Jipe.

Chilocorus biplagiatus, Walker, List Col. Lord, p. 19, Harkeko.

Exchomus pulchellus and *ventralis*, Gerstäcker, l. c. p. 346, Zanzibar.

Hyperaspis albidiceps, Walker, l. c., Cairo; *H. teinturierii*, Muls. & Godart, Ann. Soc. L. Lyon, xviii. p. 102 (Op. Ent. xiv. p. 126), Biskra; *H. puella*, Mulsant, l. c. p. 327, Colombia; *H. guttulata*, Fairmaire, Ann. Soc. Ent. Fr. (4) x. p. 404, Algeria.

Brunus nigrifrons, Gerstäcker, l. c. p. 347, Mombas.

Epilachna tetracycla, proserpina, callipepla, macropis, scalaris, p. 347, protes, *id.* l. c. p. 348, Zanzibar; *E. novenaria*, Mulsant, l. c., Colombia.

Pharus bardus, *id.* & Godart, l. c. p. 198 (Op. p. 222), Bone.

Scymnus bicinctus, *id.* l. c. p. 199 (Op. p. 223), Bone; *S. lividus*, Bold, Cat. Ins. North. Durh. (Rev. Col.), p. 109, England.

HYMENOPTERA

By E. C. RYE.

AICHINGER, VALENTIN VON. Beiträge zur Kenntniss der Hymenopteren-Fauna Tyrols. Z. Ferd. (3) xv. pp. 293–330.

This work, from a notice in B. E. Z. xv. p. 288, seems to consist of a catalogue of Tyrolean *Tenthredinidæ*, *Uroceridæ*, *Sphegiformes*, and *Heterogyna*. Two new spp. of *Fossores* appear to be described in it.

GIRAUD, J. *Miscellanées Hyménoptérologiques*. Ann. Soc. Ent. Fr. (5) i. pp. 375-419.

Accounts of the economy of various *Hymenoptera*, with descriptions of some new spp.

HORNE, CHARLES. Notes on the Habits of some Hymenopterous Insects from the North-west Provinces of India. With an Appendix containing Descriptions of some new Species of Apidæ and Vespidae collected by Mr. Horne: by Frederick Smith, of the British Museum. Illustrated by Plates from Drawings by the author of the Notes. Tr. Z. S. vii. pp. 161-196, pls. 19-22.

The title of the appendix should have extended to the *Pompilidæ*, *Sphégidæ*, *Larridæ*, *Crabronidæ*, and *Eumenidæ*, all of which are recognized as families in it.

LINDEMANN, C. Das Skelet der Hymenopteren. Bull. Mosc. xlv. pp. 306-325.

General observations on external anatomy (*cf.*, in connexion with this, the author's work on the anatomy of *Coleoptera*, *op. cit.* 1865).

SCHENCK, AD. Mehrere seltene, zum Theil neue Hymenopteren. S. E. Z. xxxii. pp. 253-257.

Two new species are described (*Chrysis* and *Andrena*).

SMITH, FREDERICK. A Catalogue of the Aculeate Hymenoptera and Ichneumonidæ of India and the Eastern Archipelago. P. L. S. xi. pp. 285-415.

To this is prefixed an account by Wallace of his experience as to the numbers, distribution, and habits of the *Hymenoptera* of the Malayan archipelago. The catalogue itself enumerates 1597 spp.; and there is a table of the distribution &c. of the different genera in the various islands of the Indian and Australian regions.

——. Notes on the Aculeate Hymenoptera of South Devon. Ent. Ann. 1872, pp. 93-106.

References to rarities, with a list, and descriptions of 2 new species.

——. A Catalogue of British Hymenoptera; Aculeata. Published by the Entomological Society of London. (Being part of a proposed General Catalogue of the Insects of the British Isles.) London: 1871, 8vo, pp. 44.

This second part of the proposed General Catalogue above mentioned (the first comprising the *Neuroptera*, by McLachlan, including the *Ephemeridæ* by Eaton) enumerates, with copious synonymy and references, 35 species of *Heterogyna*, 119 *Fossores*, 20 *Diploptera*, and 204 *Anthophila*. For an ex-

haustive and depreciatory criticism of the compiler's treatment, in a literary more than an entomological view, *cf.* Dunning, Ent. M. M. viii. p. 212 *et seq.*

SMITH, FREDERICK. [See HORNE.]

——. [See MOORE, "General Subject."]

WALKER, FRANCIS. A List of Hymenoptera collected by J. K. Lord, Esq., in Egypt, in the neighbourhood of the Red Sea, and in Arabia; with descriptions of the New Species. London: 1871, pp. 59.

The title sufficiently explains this work, except that the new species cannot with truth be said to be described in it. 293 species are enumerated. The *Crabronidae* and *Cerceridae* (of the *Fossores*) and the *Eumenidae* (of the *Diploptera*) are treated as members of the *Nyssonidae*, and the *Andrenidae* are made to include *Osmia*, *Xylocopa*, &c.

Rondani (*cf.* "General Subject") begins, in Bull. Ent. Ital. iii., a catalogue of parasitic insects in alphabetical order, in which he discusses the *Hymenoptera*, reaching *Ichneumon*.

The larvæ of a hymenopterous parasite upon *Pimelia* are referred to by Scudder, Am. Nat. v. p. 788.

Dorset. Rare species are recorded by Dale (Pr. E. Soc. 1871, p. xxiv) from this county.

Wassenaarsche sand-hills. Ritsema, Tijdschr. Ent. (2) vi. p. 48, gives a list of species taken here, either rare or new to the Dutch fauna.

Alpes dauphinoises. Giraud, Ann. Soc. Ent. Fr. (5) i. Bull. p. xlix, records rare and new species from this district, some of them being fully treated elsewhere in the same publication.

Wallis. Dietrich (Ent. Blätt. p. 21) gives a list of species occurring in this Canton.

Nova Scotia. Walker (Canad. Ent. iii. p. 197) gives a short list of species named by Smith from this country.

APIDÆ.

Andrenides.

Puton, Ann. Soc. Ent. Fr. (5) i. p. 91, describes both sexes of an insect which he attributes to *Prosopis dilatata*, K., but which (p. 92, note) he afterwards states = *gerstæckeri*, Hensel. According to his observations, the members of the genus are not parasitic upon *Osmia*, but make their own nests.

Hyleus. Förster (Verh. z.-b. Wien, xxi. pp. 872-1084) monographs this genus, repudiating the almost universally accepted name of *Prosopis*, on account of *Prosopis*, L. (*Leguminosæ*). The generic and specific characters are given at very great length; and the author describes 94 species (including 68 considered new, besides 13 of which he is uncertain). The following observations occur:—*Mellinus labiatus*, F., = *H. variegatus*, F., ♂, p. 890; *H. rinki*, Gorski, is redescribed, p. 900; *annularis*, Kby., Sm., = *dilatatus*, Kby., Sm., ♀ [*cf.* Zool. Rec. vii. p. 337]; *nitidiusculus*, Schk., = *nigritus*, F., of which *tuberculatus*, Sm., = *atratus*, F., is the ♂, p. 919; *annulatus*, L., is retained, instead of

communis, and very lengthy reasons are given for this, pp. 923-929; *rubicola*, *versicolor*, and *gibbus*, Saund., are subject to parasitism of *Hylechthrus* (Col.), p. 950; *confusus* and *signatus*, Nyl., are specifically identical, p. 957; *varipes*, Sm., = *annularis*, Kby., ♀, and is renamed *subquadratus*, p. 960; *armillatus*, Nyl., = *hyalinatus*, Sm., p. 963; the intricate synonymy of *annularis*, Kby., is discussed at p. 1003, the var. β of the ♂ being provisionally named *seclusus*; *varipes*, Sm., = *pictipes*, Nyl., ♂, p. 1012; *signatus*, Sm., = *bipunctatus*, F., p. 1028.

Halictus. Lichtenstein, Ann. Soc. Ent. Fr. (5) i. Bull. p. lxxvi, describes nests and parasites (cf. *Cantharidæ*, Col.).

Hermaphroditism in *Andrena fasciata*, *helvola*, and *convexiuscula* is recorded by Schenck, S. E. Z. xxxii. p. 335 (who also states his own *A. angustipes* to be an hermaphrodite, probably of *albicrus*, K.); and in *A. thoracica* by Smith, Pr. E. Soc. 1871, p. xiv.

Andrena vitrea. ♂ described by Smith, Ent. Ann. 1872, p. 105.

Prosopis rupestris, id. *ibid.* p. 103, S. Devon; *P. albonotata*, p. 40, Cairo, *nigritula* and *rufocincta*, p. 41, Arabia, Walker, List Hym. Lord: spp. nn.

Hyleus. Förster, l. c., describes the following new species:—*H. meridionalis*, p. 890, Austria; *giraudi*, p. 903, of which Giraud, Ann. Soc. Ent. Fr. (5) i. p. 392, describes the ♀, Cervières; *barbatus*, p. 904, Carinthia and Lower Austria; *euryscapus*, p. 909, Hungary; *compar*, p. 910, Thuringia; *smithi*, p. 914, Tyrol; *alienatus*, p. 932, *fumipennis*, p. 946, *immaculatus*, p. 975, *nigriceps*, p. 977, *floricola*, p. 982, *foveolatus*, p. 993, *opacus*, p. 1018, *oculatus*, p. 1037, *assimilis*, p. 1046, *vicinus*, p. 1055, *nigricornis*, p. 1057, *nitidulus*, p. 1058, *melanarius*, p. 1066, *claripennis*, p. 1069, Aix-la-Chapelle; *subexcisus*, p. 938 (? France), from gall on *Quercus cerris*; *punctus*, p. 940, Dalmatia and Corfu; *discretus*, p. 942, Huy o. Maas; *intermedius*, p. 943, Silesia; *gredleri*, p. 944, Tyrol; *ambiguus*, p. 950, Chur; *medullitus*, p. 952, Grenoble; *kahri*, p. 954, ? Steiermark; *decipiens*, p. 965, Bavaria; *insignis*, p. 966, and *corvinus*, p. 967, Tyrol; *xanthocnemis*, p. 969, Nassau; *pectoralis*, p. 972, Germany or France; *kriechbaumeri*, p. 973, Munich, galls of *Lipara lucens*; *atratus*, p. 979, Hungary; *tyrolensis*, p. 980, Tyrol; *siculus*, p. 984, Sicily; *blandus*, p. 985, Dalmatia; *æmulus*, p. 991, S. Germany; *similatus*, p. 994, and *incongruus*, p. 998, Piesting; *prænolatus*, p. 1006, Sicily; *tricuspis*, p. 1011, Grenoble; *marginatus*, p. 1016, no locality; *spilotus*, p. 1018, S. France; *conformis*, p. 1020, ? Paris; *miscellus*, p. 1023, Italy; *rimosus*, p. 1024, Hungary; *imparilis*, p. 1033, and *exæquatus*, p. 1035, S. France; *subtilis*, p. 1039, Chur; *seductus*, p. 1040, Sicily; *brevipalpis*, p. 1041, Austria; *confinis*, p. 1043, Vienna; *rotundatus*, p. 1044, no locality; *carbonarius*, p. 1045, Laibach; *bisinuatus*, p. 1048, S. France; *politus*, p. 1050, Chur; *geniculatus*, p. 1851, Sicily; *ebeninus*, p. 1053, Austria; *subpunctatus*, p. 1054, no locality; *inæqualis*, p. 1061, Vienna; *styriacus*, p. 1062, Steiermark; *tæniolatus*, p. 1068, Sicily; *breviventris*, p. 1070, Corfu; *schencki*, p. 1071, Nassau; *moniliatus*, p. 1074, Sicily; *suspectus*, p. 1075, Chur.

Halictus determinatus, p. 41, *distinctus* and *tibialis*, p. 42, Arabia, *nigrinus*, Cairo, *decorus*, Harkeko: Walker, l. c., spp. nn.

Nomia amænula, Gerstäcker, Arch. f. Nat. xxxvii. p. 350, Mombas; *N. zonnaria*, *vespoides*, *bicoloripes*, p. 43, *rufiventris*, *femoralis*, *ampla*, *scriptifrons*, *eburneifrons*, p. 44, Red Sea; *pallicornis*, Arabia: Walker, l. c., spp. nn.

Andrena partita, p. 45 (no locality given), *turbida*, Mt. Sinai, *disparilis*,

munda, and *venusta*, Cairo, *brevipennis*, p. 46, Red Sea, *id. l. c.*; *A. distinguenda*, Schenck, S. E. Z. xxxii. p. 256, Weilburg and Mecklenburg; *A. prætexta*, Smith, Ent. Ann. 1872, p. 106, S. Devon: spp. nn.

Apides.

Hermaphroditism in *Anthophora acervorum*, *Apis mellifica*, and *Nomada baccata*, is recorded by Smith, Pr. E. Soc. 1871, p. xiv; and in *N. fucata* by Schenck, *l. c.* p. 335.

Lithurgus dentipes, Smith, *Megachile lanata*, F. (pl. xix. figs. 11a, b), *fasciculata*, Sm. (figs. 1-10), *disjuncta*, F. (figs. 12 & 12a), *Xylocopa chloroptera*, St. F. (pl. xxii. figs. 1, a, b), *X. æstuans*, L., *Apis floralis* (figs. 2, a, b, c), and *dorsata*, F. (figs. 3, a, b), figured, with details of economy, and habits &c. recorded, by Horne, Tr. E. S. vii. p. 175 *et seq.*

Epeoloides cæcidiens occurs in Nassau on *Ballota nigra*, probably parasitic on *Anthidium manicatum*; it occurs with *Macropis labiata* near St. Petersburg: Schenck, *l. c.* p. 257.

Stelis octomaculata is recorded from Sidmouth by Smith, Ent. Ann. 1872, p. 94, and figured, *ibid.* frontisp. f. 3.

Osmia. M'Lachlan (Ent. M. M. viii. p. 93) notices an instance of apparent failure of instinct in a species which for a long time failed to discover its own nest. Hudd (*ibid.* p. 109) considers this caused by a defect of sight.

Chelostoma. Giraud, Ann. Soc. Ent. Fr. (5) i. p. 391, adopts Smith's views in preference to those of Schenck, with regard to this genus and *Heriades*; he also corroborates Smith in giving 3 joints (instead of 2) to the maxillary palpi of *H. truncorum*.

Megachile anthracina, Sm., = *fasciculata*, Sm., ♀: Smith, Tr. Z. S. vii. p. 193. *M. mystacea* and *rufiventris*, Guér., = *larvata*, Gerst., ♀: Gerstäcker, Arch. f. Nat. xxxvii. p. 350. *M. brevis*, Say: economy described and figured by Reed, Canad. Ent. iii. p. 210, f. 38.

Anthophora. Lichtenstein, Ann. Soc. Ent. Fr. (5) i. Bull. p. lxxvi *et seq.*, describes the nests and parasites of a Spanish species (near *flabellipes*, Lep.), the very fluid honey of which has the execrable odour of *Hemerobius*, and whose deserted nests are utilized by 3 or 4 species of *Osmia*, the economy of which is referred to.

Merops apiaster. De Sélys-Longchamps, Bull. Ac. Belg. (2) xxxi. p. 565, records this bird from Belgium, with its crop containing nothing but *Bombus terrestris* and *lapidarius*.

Bombus. *B. lucorum* is often mistaken for *terrestris* in the north of England: Gordon, Scot. Nat. i. p. 19. *B. mastrucatus*, Gerst., occurs in Nassau, and is apparently distinct from *lapidarius*: Schenck, S. E. Z. xxxii. p. 257. "Fish-tail" hairs from leg of humble-bee are described and figured in Sci. Goss. 1871, p. 140, fig. 73.

Apis mellifica. Simmonds, under the head "The Honey Trade," gives some interesting statistics of bee-culture in various countries: Pharm. J. & Tr. (3) pp. 167, 183, 205. Vogel's observations on the principles of bee-breeding are translated in Am. Nat. v. p. 17. Smith (Pr. E. Soc. 1871, p. v) notes the mention by Pepys of an observatory bee-hive in 1665. Giraud, Ann. Soc. Ent. Fr. (5) i. Bull. p. lxiii, records the occurrence, near Paris, in the middle of October, of an enormous swarm of bees. On artificial swarming, cf. M'Lure,

Sci. Goss. 1871, pp. 15-17, fig. 12. Munn's amplified edition of Bevan's 'Honey-Bee' is reviewed in Ent. M. M. vii. p. 262. Bevan Fox (Gard. Chron. Jan. 15, 1871) refers to "encasement" of queen-bees. Mantegazza ('L'Igea,' Jan. 1871) records experiments upon the poison of the bee. Penny (Ent. v. p. 315) refers to an instance of a bee being caught by a spider that mimicked the stigmata of *Barbarea vulgaris*.

New species :—

- Epeolus nigriventris*, Walker, l. c. p. 51, Tajura.
Megilla caligata, Gerstäcker, l. c. p. 349 (P Zanzibar).
Allodape syrphoides, Walker, l. c. p. 50, and ♀ var., Tajura; *A. trochanterata*, Mombas, *flavitaris*, Wanga, Gerstäcker, l. c. p. 350.
Calioxyx angulata, Smith, Tr. Z. S. vii. p. 192, N.-W. India; *C. antica* and *rufispina*, Walker, l. c. p. 51, Harkeko.
Stelis dimidiatus, id. l. c. p. 49, Red Sea.
Heriades glutinosus, Giraud, l. c. p. 389, Saragossa (lives in old nests of *Polypæus*, *Chalicodoma*, and *Anthophora*).
Osmia contracta, Walker, l. c. p. 47, Red Sea.
Megachile fulvescens, p. 47, *inornata*, *inficita*, *despecta*, p. 48, Arabia, *adusta*, p. 47, Red Sea, *conficita*, p. 48, Cairo: id. l. c. *M. proxima*, Smith, l. c., N.-W. India (habits &c. recorded by Horne, *ibid.* p. 177).
Anthidium subochraceum, p. 49, Mt. Sinai, *signiferum*, p. 50, Red Sea: Walker, l. c.
Eucera fulvescens, p. 52, *ampla* and *pilosa*, 53, Cairo; *cinerascens*, Arabia, p. 52: id. l. c.
Tetralonia macrognatha, Gerstäcker, l. c., Mombas; *T. blanda* and *vetusta*, p. 53, *amæna* and *decora*, p. 54, Red Sea, *invaria*, Cairo, *spoliata*, Mt. Sinai, p. 54, Walker, l. c.
Anthophora annulifera (P = *calens*, var., sec. auct.), p. 55, *lutescens*, p. 56, *pauperata*, *illepida*, p. 57, *superans*, p. 58, Arabia; *senilis*, p. 55, *melaleuca*, p. 56, Cairo; *bimaculifera*, *cana*, p. 56, *bimaculifera* [again], *punctifrons* (P = *bimaculifera*, var., sec. auct.), *pulverea*, p. 57, *inclyta*, p. 58, Red Sea: id. l. c.
Bombus atrocinctus (pl. xxi. f. 13) and *terminalis*, Smith, l. c. p. 193, N.-W. India; *impetuosus*, id. Proc. Z. S. 1871, p. 249, pl. xviii. f. 8, Yunnan.
Trigona ruficornis, id. Tr. Z. S. vii. p. 194, N.-W. India (habits recorded by Horne, *ibid.* p. 185).
Apis laboriosa, id. Proc. Z. S. 1871, p. 249, pl. xviii. f. 7, Yunnan.

VESPIDÆ.

Ceramius lusitanicus. Giraud, Ann. Soc. Ent. Fr. (5) i. pp. 375-379, records the economy of this species, which bores a hole in the ground, and supplies its burrow with a chimney, like *Odynerus*.
Eumenes conica and *esuriens*, *Odynerus punctum*, *Rhynchium carnicum*, *brunneum*, and *nitidulum*: habits recorded, and imago (with cells &c.) figured, by Horne, Tr. Z. S. vii. pp. 166-168, pl. x. *Icaria variegata* (pl. xx. figs. 8, u, & 9) and *ferruginea*, *Polistes hebræus* and *stigma*, *Vespa velutina*, *orientalis*, and *cincta*: habits &c. recorded, id. l. c. p. 169 et seq.
Rhynchium brunneum. Smith refers to a specimen found by Dr. Birch on unrolling an Egyptian mummy, and repeats Owen's statement that hiero-

glyphic inscriptions are obliterated by being filled with mud by this species in making its nests: Pr. E. Soc. 1871, p. v.

Polistes gallica and *diadema*. For very extended observations upon the occurrence in and influence of parthenogenesis on these insects (considered races of one species), cf. v. Siebold, Beiträge &c. pp. 1-101, pl. i. These are too long for extraction or useful abstraction; but the author's final conclusions are:—1, that the unimpregnated ova bring with themselves from the ovary the capacity of producing male individuals; 2, that such males are developed by inherent property, and independently of external male influence; 3, that, under the influence of male spermatozoa, such ova are capable of changing their faculty of producing only males, and can develop female individuals.

Vespa holsatica. For short observations upon parthenogenesis in this species, cf. *id.* l. c. pp. 102-105.

Vespa crabro. Smith (*l. c.* p. vii) corroborates Réaumur's mention of a habit in this species of removing bark from small branches, and thinks the insect in that case is endeavouring to extract sap as food, and not to obtain material for its nest.

New species :—

Zethus favillaceus, Walker, *l. c.* p. 28, Tajura.

Eumenes mainpuriensis, Smith, Tr. Z. S. vii. p. 189, pl. xx. figs. 3 & 3a, N.-W. India (habits recorded by Horne, *ibid.* p. 167); *E. bisignatus*, p. 29, *leptogaster* and *dilectula*, p. 30, Arabia, *signicornis*, *ibid.*, Massowah, Walker, *l. c.*

Synagris tarsalis, Gerstäcker, Arch. f. Nat. xxxvii. p. 350, Mombas.

Rhynchium ardens, *fervens*, and *zonatum*, Walker, *l. c.* p. 31, Arabia.

Odynerus jocosus, Gerstäcker, *l. c.* p. 351, Mombas. *O. flavus* and *torridus*, p. 33, *tinctus*, *selectus*, *privatus*, *diversus*, p. 34, *dotatus*, *cognatus*, *exustus*, p. 35, *alienus*, p. 39, Arabia; *stipatus*, *albifer*, p. 36, *inornatus*, *rotundatus*, p. 37, *fumipennis*, p. 38, *disjunctus*, p. 39, Cairo; *guttulosus*, p. 36, *cingulifer*, p. 37, *concinulus*, *notabilis*, p. 38, Red Sea (for synoptical table, cf. pp. 32 & 33): Walker, *l. c.*

Pterochilus pulchellus, Smith, *l. c.* p. 190, pl. xxi. figs. 8, 8a, 8b, N.-W. India (habits recorded by Horne, *ibid.* p. 168).

Polistes badia and *plebeia*, Wanga, *defectiva*, Uru: Gerstäcker, *l. c.* p. 351.

Vespa vivax, p. 190, pl. xxi. f. 9, *flaviceps*, p. 191, figs. 10 & 11 (habits &c. recorded by Horne, *l. c.* p. 174), *structor*, *ibid.* f. 12, N.-W. India, Smith, *l. c.*; *V. bellona*, *ul.* Proc. Z. S. 1871, p. 248, pl. xviii. f. 6, Yunan.

CRABRONIDÆ.

Philanthides.

Philanthus apivorus. Lucas, Ann. Soc. Ent. Fr. (4) x. Bull. pp. xci & xcii, records the mode of securing *Apis mellifica* adopted by this species.

Cerceris alboatra, p. 27, Arabia, *contigua*, p. 28, Tajura: Walker, *l. c.*, spp. nn.

Crabronides.

Psen atratus. Puton, Ann. Soc. Ent. Fr. (5) i. p. 94, fully describes its sexual differences.

Trypoxylum intrudens, p. 188, *rejector*, p. 189, pl. xxi. f. 4 & 4a, N.-W. India (habits recorded by Horne, *ibid.* p. 164) : Smith, *l. c.*, spp. nn.

Crabro granulatus, p. 26, *confinis* and *perpusillus*, p. 27, Cairo, Walker, *l. c.* ; *C. (Thyreopus) rhæticus*, Aichinger, Z. Ferd. (3) xv., Tyrol : spp. nn.

Cemonus dentatus, sp. n., Puton, *l. c.*, Vosges.

Nyssonides.

Larra vespoides and *latifascia*, p. 25, *annulata*, p. 26, Red Sea, *subapicalis*, p. 25, Arabia : Walker, *l. c.*, spp. nn.

Larrides.

Parapison. Smith, Tr. Z. S. vii. p. 187, gives the characters of this and *Pisonitus*, apparently with the intention of treating them as mere subdivisions of *Pison*, though describing a new species under one of them as a separate genus.

Pisonitus rugosus, Sm. Figured and habits recorded by Horne, *l. c.* p. 165, pl. xxi. figs. 5 & 5a.

Larrada nigricans, *subfasciata*, *diversa*, Cairo, *conjungens*, Dahleck : Walker, *l. c.* p. 21, spp. nn.

Tachytes plagiatus and *contractus*, p. 22, *cephalotes*, *albonotatus*, and *mutiloides*, p. 23, *brevis*, p. 24, Red Sea ; *lugubris*, p. 22, *decoratus*, p. 23, Arabia : *id. l. c.*, spp. nn.

Tachytes rufipes, sp. n., Aichinger, *l. c.*, Tyrol.

Parapison rufipes, sp. n., Smith, *l. c.* p. 188, pl. xxi. f. 1, *a, b*, N.-W. India (habits recorded by Horne, *ibid.* p. 165).

Sphegides.

Pelopæus spirifex. Mulsant & Mayet (Ann. Soc. L. Lyon, xviii. p. 311 *et seq.*) give an account of the economy of this species, which feeds on *Mene-mexus [rectius Menemachus]*, and as such used in *Coleop.* *vigoratus (Arachn.)*.

Pelopæus madraspatanus, *bilineatus*, and *bengalensis*. These and nests figured, and economy recorded, by Horne, *l. c.* pp. 161-163, pl. xxi.

Ammophila strenua, Cairo, *filata*, Arabia, *nigritaria*, Red Sea, p. 18, *areolata*, p. 19, Arabia, Walker, *l. c.* ; *A. ponderosa*, Gerstäcker, *l. c.* p. 352, Endara ; *A. fuscipennis*, Smith, *l. c.* p. 187, N.-W. India : spp. nn.

Pelopæus curvatus, sp. n., *id. ibid.*, N.-W. India.

Sphex argentifer, Walker, *l. c.* p. 19, Akeek (Red Sea) ; *S. incomptus*, Gerstäcker, *l. c.* p. 352, Wanga : spp. nn.

Chlorion bicolor, sp. n., Walker, *l. c.* p. 20, Arabia.

Pompilides.

Pompilus niger. The insect mentioned by Lichtenstein under this name [Zool. Rec. vii. p. 344] as bred from the back of a spider, is now stated by him, *teste* Giraud, to be *Priocnemis (Anoplius) hyalinatus*, Lep. (*nec* Dahlb.).

Pompilus ruficeps, Tasch., = *xanthocerus*, Dahlb., = *bretoni*, Guér. : Gerstäcker, *l. c.* p. 352.

Aporus femoralis redescribed and recorded from S. Devon by Smith, Ent. Ann. 1872, p. 104.

Pompilus innitens and *melanophilus*, Walker, *l. c.* p. 15, Arabia; *P. maculipes*, Smith, Tr. Z. S. vii. p. 186, N.-W. India: spp. nn.

Agenia bizonata, Cairo, *terminalis* and *tristis*, Arabia, *decora*, Harkeko, Walker, *l. c.* p. 16; *A. mutabilis*, Smith, *l. c.*, N.-W. India: spp. nn.

Evagethis bicolorifer, sp. n., Walker, *l. c.*, Red Sea.

Ferreola divisa, Red Sea, *carbonaria*, Mt. Sinai : *id.* *l. c.* p. 17, spp. nn.

Hemipepsis prodigiosa, Moschi, *contumax*, Mombas : Gerstäcker, *l. c.* p. 352, spp. nn.

Sapygides.

Sapyga punctata is certainly of parasitic habits, living at the expense of an *Osmia* frequenting *Verbascum thapsus*, and also attacking *Odynerus*, *Chalicodoma muraria*, &c. *S. cylindrica* is parasitic upon an *Odynerus* nesting in stems of elder: Giraud, Ann. Soc. Ent. Fr. (5) i. Bull. p. xvii.

Scoliides.

Tiphia tarda. Smith (Pr. E. Soc. 1871, p. xl) refers to the double case of the cocoon of this species, and believes the larva of *Tiphia* feeds on larvæ of *Aphodius*.

Tiphia latipes, sp. n., Walker, *l. c.* p. 14, Massowah.

Myzine flavicollis, p. 11, and *punctifascia*, p. 12, Walker, *l. c.*, Arabia; *M. xanthocera*, Gerstäcker, *l. c.* p. 353, See Jipe : spp. nn.

Discolia luteicornis, Massowah, and *atratura*, Arabia, Walker, *l. c.* p. 13 : spp. nn.

Dielis longispina, *id.* *l. c.* p. 14, Arabia; *D. hymenæa* and *soleata*, Gerstäcker, *l. c.* p. 353, Wanga : spp. nn.

MUTILLIDÆ.

Mutilla aureiventris, Walker, *l. c.* p. 11, Red Sea; *M. straba*, p. 353, See Jipe, *pygidialis*, Moschi, *suavis*, Mombas, p. 354, Gerstäcker, *l. c.* : spp. nn.

FORMICIDÆ.

Formica virescens, Smith, *pt.*, = *Æcophylla longinoda*, Latr.; *F. cognata*, Sm., = *Camponotus maculatus*, F.; *Pseudomyrma natalensis*, Sm., = *capensis* Sm., ♀; *Physatta natalensis*, Sm., ? = *Heptacondylus eumenoides*, Gerst.: *id.* *l. c.* p. 354 *et seq.*

Formica herculeana is recorded by Westwood (Pr. E. Soc. 1871, p. xxxvi) as found in the crop of *Picus martius*, stated to have been shot in Oxfordshire. Weir (*ibid.*) disbelieves the British origin of the bird; and subsequent discussions (p. xxxviii) tend to confirm his opinion.

Formica flava and (?) *herculeana*. On migration and habits, *cf.* Warner, Sci. Goss. 1871, pp. 183 & 198.

White ants. For an account of personal experiences as to habits &c., *cf.* Horne, *ibid.* pp. 1-5, figs. 1-10.

Polyergus rufescens and *Formica sanguinea*. On habits of these slave-drivers, *cf.* Lefroy, *ibid.* p. 272.

Myrmica ruginodis. For account of economy, cf. Elwin, *ibid.* pp. 245–248.

Camponotus ligniperdus is recorded from Zürich, and its habits are noted, by Labhardt, in Viert. Ges. Zürich, xv. p. 188.

Aphanogaster structor and *capitata* store seeds of late-fruited plants, especially *Polygonum vulgare*, in excavations in sandstone-rock at Mentone: Moggridge (Pr. E. Soc. 1871, p. xlvii).

Formica æqualis, sp. n., Walker, l. c. p. 9, Arabia.

Camponotus phæogaster, *id.* l. c. p. 10, Arabia; *C. kersteni*, *chrysurus*, *erinaeus*, Gerstäcker, l. c. p. 355, Zanzibar: spp. nn.

Cataglyphis bicoloripes, sp. n., Walker, l. c. p. 10, Cairo.

Aphanogaster debilis, *ibid.*, Arabia, *pallescens*, p. 11, Cairo: *id.* l. c., spp. nn.

Cremastogaster cephalotes, sp. n., Gerstäcker, l. c. p. 356, Mombas.

Phidole talpa, Mbaramu, *scabriuscula*, Endara: *id.* *ibid.*, spp. nn.

CHRYSIDIDÆ.

Chrysis neglecta and *ignita*, parasites upon *Odynerus spinipes*. Chapman (Ent. M. M. vii. pp. 250–253) supplements his observations on these species.

Chrysis saussurii, Chevr. Schenck (S. E. Z. xxxii. p. 253) redescribes this species, found by him near Weilburg, on *Ægopodium podagraria* and *Centaurea cyanea*.

Holopyga jurinii and *angustata*. Characters noted, and the identity of the latter with *Ellampus generosus*, Först., suggested: *id.* l. c. p. 255.

Hedychrum stilboides, sp. n., Walker, l. c. p. 9, Cairo.

Chrysis sinaica and *seminigra*, p. 7, *multicolor*, *electa*, and *communis*, p. 8, *id.* l. c.; *C. minutula*, Schenck, l. c. p. 254, Dortmund: spp. nn.

Parnopes apicalis, sp. n., Walker, l. c. p. 6, Tajura.

Euchærus pallispinosus, sp. n., *id.* *ibid.*, Cairo.

ICHNEUMONIDÆ.

TSCHERK (Verh. z.-b. Wien, xxi. pp. 37–68), under the heading “Ichneumonologische Fragmente, i.,” describes various new spp. (chiefly Austrian) of *Pimplides* and *Ophionides*, with observations upon others already known.

An ichneumonidous parasite on *Charocampa panpinatrix* is referred to and figured in i. Rep. Ins. Ont. pp. 96 & 97.

Ratzeburg (SB. nat. Fr. 1871) notes prevalence of small Ichneumons in a “Kieferspinner” (♀ *Ennomos lituraria*).

Ichneumonides.

TISCHBEIN (S. E. Z. xxxii. pp. 155–160) gives a list of the species of *Ichneumon* of which he has during 30 years observed hibernating individuals; these are 37 in number (including two of the subgenus *Phæogenes*, Wesm., indicated as new); and a corresponding account is given of the times at which the same spp. are observed on the wing; but the point of his remarks is, that the hibernating individuals are invariably females, and that they are of the genus *Ichneumon*, Wesm., and never, or extremely seldom, of any other genera of the *Ichneumonides*, to which many of the genus *Ichneumon* are so closely allied. A

♀ of *Campoplex mixtus*, Poll., and another of a new sp. of *Hemiteles*, appear to be the only others of that sex observed to hibernate by the author. The males are presumed to pass the winter as larvæ or pupæ; and a suggestion is made as to a microscopic investigation to discover whether (as seems most probable from analogy with wasps &c.) the hibernating females are fecundated.

Ichneumon angustus = *defraudator*, Koch, ♀, var.: *id. l. c.* p. 158, note.

Phæogenes. The coxal processes are not reliable as diagnostic characters in this subgenus: *id. ibid.*

Ischnus truncator, Gr. ♂ described by Giraud, Ann. Soc. Ent. Fr. (5) i. p. 396.

Diplomorphus, g. n., *id. l. c.* p. 409. Facies of *Braconides*, but one of the *Ichneumonides* by alar neuration. *D. thoracicus*, sp. n., *id. ibid.*, Vallouise, Htes. Alpes, on *Berberis vulgaris*, parasitic upon *Hylotoma*.

Aglyphus, g. n., *l. c.* p. 411. Impunctate, somewhat resembles *Diplomorphus*. *A. nigripennis*, sp. n., *id. ibid.*, Bologna.

Ichneumon opulentus, p. 307, *kastneri*, p. 309, Taschenberg, Z. ges. Naturw. xxxviii., Innsbruck, spp. nn.

Hoplomenus 7-guttatus, sp. n., *id. l. c.* p. 310, Innsbruck.

Ischnus tineidarum, p. 393, Austria and Bologna (parasitic on *Taleporia politella* and *pseudobombycella*, *Argyresthia nitidella* and *panzerella*), *nigrinus*, p. 395, Verney, Isère (? parasitic on *Coleophora lugduniella*): Giraud, *l. c.*, spp. nn.

Cryptides.

Pezomachus trux, Först. Marshall (Ent. M. M. viii. p. 162) records the discovery of ♂ of this sp., stating it to be *Hemiteles tenuicornis*, Grav., Desvignes, and that it was bred from *Coleophora vibicella*. He also notes a ♀ Corsican specimen of *Agrothereutes abbreviator*, F., with fully developed wings, being thereby converted into a *Cryptus*. The ♂ *Hemiteles* is subsequently stated by Marshall to be *palpator*, Gr.; and the species is referred to *Hemimachus*, Ratz., Förster's trivial name being adopted.

Cryptus longiseta, Taschenberg, *l. c.* p. 42, Chili; *C. leucopygus*, Walker, *l. c.* p. 1, Cairo; *C. erberi*, Tschek, *l. c.* p. 43, Corfu: spp. nn.

Ophionides.

Campoplex. Tischbein (*l. c.* p. 159, note) describes copulation by two individuals of this genus, observed by himself.

Sagaritis. Tschek, *l. c.* pp. 45-53, enumerates 11 Austrian spp. He supplements Holmgren's *S. congesta* by the ♀ characters; considers that Holmgren's *S. zonata* is for the most part to be referred to *latrator*, Gr., but adds characters for true *zonata*, Gr., from Austrian examples; indicates a probable confusion between *S. ebenina*, Gr., and *agilis*, Holm.; and refers *Porizon borealis*, Zett., to this genus in preference to *Limneria*, to which Holmgren assigns it.

Casinaria. 11 Austrian spp. enumerated, and a doubt indicated of the correct reference to it of *Campoplex albipalpis*, Grav., by Holmgren: *id. l. c.* pp. 54-59.

Limneria ensator, Gr. Some examples bred from a root of *Artemisia ab-sinthium* infested by larvæ of a *Grapholita* and of some beetle, are referred with doubt to this sp.: *id. l. c. p. 65*.

Campoplex seniculus, Ratz., nec Grav., is a *Limneria*, and is redescribed under the name *ratzeburgi*: *id. l. c. p. 64*.

Pyracmon fulvipes, Holmgr. An Austrian insect, possibly ♀ of this sp. (but ? a *Rhimphoctona*, and, if not correctly referred specifically, named *rufipes*), is briefly described: *id. l. c. p. 62*.

Campoplex tarsalis and *posticus*, Walker, *l. c. p. 2*, Cairo; *C. tenthredinum*, Tschek, *l. c. p. 44*, Austria, bred from larva of a *Cimbex* found on *Salix caprea*: spp. nn.

Sagaritis cognata, p. 46, *maculipes*, p. 49, *holmgreni*, p. 50, *crassicornis*, p. 51, Austria: Tschek, *l. c.*, spp. nn.

Casinaria stygia, p. 54, *varians*, p. 55, *affinis*, p. 56, *dubia*, p. 57 (of which the ♂ is possibly not correctly referred), *scutellaris*, p. 58, Austria: *id. l. c.*, spp. nn.

Limneria færsteri, p. 59, Rhodes, *oculata*, p. 60, *vulgaris*, p. 61 (the *Sagaritis ebenina* of most colls., *teste auct.*, p. 53), and *nematorum*, p. 65, bred from larvæ of a *Nematus*, Austria: *id. l. c.*, spp. nn.

Pyracmon austriacus, sp. n., *id. l. c. p. 62*, Austria.

Plectiscus tenthredinarum, sp. n., Giraud, *l. c. p. 396*, Vincennes, parasitic on *Dineura verna* and *Selandria melanocephala* (*Tenth.*): economy described, *l. c. pp. 387 & 388*.

Porizon (? *Thersilochus*, *teste* Cresson) *conotracheli*, sp. n., Riley, iii. Rep. Ins. Mo. p. 28, f. 9, New Jersey (parasitic on *Conotrachelus nenuphar*).

Eugnomus, Först.: Tschek, *l. c. p. 67*, recharacterizes this genus, describing a new sp. from Asia Minor, under the name *manni*.

Tryphonides.

BRISCHKE, in the 4th part of his work, "Die Hymenopteren der Provinz Preussen" (Schr. Ges. Königsb. xi. pp. 64–106), treating exclusively of this subfamily, indicates the following parasitism in its members:—*Mesoleptus cingulatus*, Gr., *Catoglyptus foveolator*, Holmgr., and *Euryproctus regenerator*, F., on *Tenthredo scalaris*; *C. fuscicornis*, Gm., on *T. punctulata*; *Euryproctus nigriceps*, Gr., on *Clavellaria amerina*; *E. chrysostomus*, Gr., on *Tenthredo agilis*; *Perilissus filicornis*, Gr., on *Nematus latipes*, *fraxini*, and *erichsoni*, and on *Dolerus*; *P. vernalis*, Gr., on *Tenthredo*; *P. pallidus*, Gr., on *T. repanda*; *P. limitaris*, Gr., on *Nematus ventricosus*; *P. lutescens*, Holmgr., on *Athalia spinarum*; *P. gorskii*, Ratz., on *Selandria annulipes* and *Schizocera geminata*; *P. pictilis*, Holmgr., on *Fenusa*, from elm; *P. macropygus* and *soleatus*, Holmgr., on *Fenusa betulæ*; *P. oblongopunctatus*, Hart., on *Lophyrus rufus*; *Mesolius rufus*, Gr., on *Trichiosoma lucorum* and *T. sorbi*; *M. aulicus*, Gr., on *Cladius viminalis* and *Nematus fulvus*; *M. opticus*, Gr., on *N. fulvus* and *pavidus*; *M. sanguinicollis* and *bilineatus*, Gr., on *Nematus*; *M. grossulariæ*, Ratz., on *N. ventricosus*, *conjugatus*, and *septentrionalis*; *M. unifasciatus*, Holmgr., on *Selandria stramineipes*; *M. transfuga*, Holmgr., on *Nem. hypogastricus* and *testaceus*; *M. niger*, Gr., on *Tenthredo* from *Pteris aquilina*; *M. segmentator*, Holmgr., on *Nem. perspicillaris* and *salicis*; *M. insolens*, Gr., and *rufilabris*, Zet., on *Tenthredo*; *M. transiens*, Ratz., on *Lophyrus*; *M. leptogaster*, Holmgr., on *Nematus hypogastricus*; *Trematopygus discolor*, Holmgr.,

on *Lophyrus rufus*; *T. erythropalpus*, Gr., on *Dolerus gonager*; *T. impressus*, Gr., on *Lophyrus*; *Grypocentrus incisulus*, Ruthe, on *Fenusa*; *Adelognathus ruthii*, Holmgr., on *Emphytus filiformis*; *Monoblastus lævigatus*, Holmgr., on *Nematus fulvus*; *M. neustriæ*, Ratz., on *N. citreus*; *M. palustris*, Holmgr., on *N. cirrhopus* and *gracilis*; *M. erythropygus*, Holmgr., on *Dineura alni*, *Tenthredo*, and *Lophyrus*; *Polyblastus mutabilis*, Holmgr., on *N. myosotidis*; *P. sanguinatorius*, Ratz., on *Cladius viminalis*; *P. senilis*, Holmgr., on *Nematus*; *Erromenus hæmorrhoeicus*, Htg., on *Lophyrus*; *Acrotomus lucidulus*, Gr., on *C. viminalis*; *A. orbitarius*, Schdt., on *Selandria stramineipes*; *Cteniscus liturarius*, L., on *Dineura rufa* and *Nematus pavidus*; *C. 6-cinctus*, Gr., on *D. alni*; *C. succinctus*, Gr., on *N. chilon*; *C. marginatorius*, F., on *L. pini*; *C. adspersus*, Htg., on *L. pallidus*; *C. borealis*, Holmgr., on *Tenthredo*; *C. frigidus*, Holm., on *N. fulvus* and *ventricosus*; *Exochus curvator*, Gr., and congener, Holmgr., on *Depressaria* from *Verbascum*; *E. podagricus*, Gr., on *Tortrix* and *Lithocolletis*; *Orthocentrus agilis*, Holmgr., ? on *Heledona agaricola*; *Bassus albosignatus*, Gr., on *Syrphus*; *Metopius migratorius*, Gr., on *Harpyia bifida* and (?) *Acronycta psi*.

Mesolius formosus and *armillatorius*, and *Mesochorus politus*, Grav., *Perilissus macropygus* and *soleatus*, and *Tryphon ephippium*, Holmgr., with three new spp., are noted as parasitic upon larvæ of *Selandria*, and the first two, with *Polyblastus palustris* (?), Holmgr., *Erromenus fasciatus*, Grav., and a new species, upon those of *Dineura verna*, Kl.: Giraud, l. c. pp. 386 & 387. The ♀ of *M. formosus*, considered to be erroneously associated with the ♂ which Gravenhorst describes (both sexes being properly recorded by Holmgren), is named *lepidus*: id. l. c. p. 401.

Erromenus fasciatus, Gr., redescribed: id. l. c. p. 404.

New species:—

Mesoleptus coxalis, Brischke, l. c. p. 65, Prussia.

Catoglyptus scaber, id. l. c. p. 67, Prussia.

Euryproctus sinister, id. l. c. p. 68, Prussia.

Perilissus verticalis, p. 71 (bred from larvæ of *Fenusa betulæ*), *longicornis* and *sericeus*, p. 72, id. l. c., Prussia; *P. luteocephalus*, Giraud, l. c. p. 397, Grenoble, parasitic on *Selandria micans*.

Mesolius trochanteratus, p. 73, *maculatus* and *marginatus*, p. 74, *brischkii* (Holmgren in litt.), p. 75, *abbreviatus* and *latipes* (from larva of *Nematus perspicillaris*), p. 76, *brevis* and *annulatus*, p. 77, *abdominalis* and *bipunctatus*, p. 78, *pictus* and *cognatus*, p. 79, *cingulatus*, p. 80, *elongatus*, *agilis* (from larvæ of *Macrophya simulans*), and *lunaris*, p. 81, *pectoralis* and *nigropalpis*, p. 83, *flavipes*, p. 84, *impressus* (from larvæ of *Cladius uncinatus*) and *exculpus*, p. 85, Prussia: Brischke, l. c.

Trematopygus facialis, id. l. c. p. 87, Prussia; *T. selandrivorus* and *aprilinus*, Giraud, l. c. pp. 402 & 403, no locality, parasitic on *Selandria melanocephala* and *pubescens*.

Tryphon incertus and *nigrinus*, Brischke, l. c. p. 88, Prussia; *T.* (? *Polyblastus*) *lateralis*, Giraud, l. c. p. 401, no locality, parasitic on *Selandria melanocephala* and *pubescens*.

Grypocentrus anomalus, Brischke, l. c. p. 89 (from *Fenusa*-larvæ on oak), Prussia.

Monoblastus spinosus, *id. l. c.* p. 91, Prussia.

Polyblastus ruficornis and *validicornis*, p. 92, *aberrans* (from larvæ of *Fenus rubi*) and *holmgreni*, p. 93, *grossus*, p. 94, Prussia, *id. l. c.*; *P. annulicornis*, Giraud, *l. c.* p. 406, Vienna.

Erromenus analis, p. 95 (from larvæ of a small *Nematus* on *Salix viminalis*), *exareolatus* and *fumatus* (from larvæ of *Selandria adumbrata*), p. 96, Prussia: Brischke, *l. c.*

Exochus maculatus, *id. l. c.* p. 100, Prussia.

Orthocentrus rufescens and *lineatus*, p. 102, *frontalis*, *rufipes*, *setiger*, and *curvicaudatus*, p. 103, Prussia: *id. l. c.*

Bassus suspiciosus, *id. l. c.* p. 106, Prussia.

Pimplides.

Ephialtes dux: ♀ recorded by Tschek, *l. c.* p. 38.

Pimpla pictipes: ♀ characters added to Gravenhorst's description, *id. ibid.*

Pimpla chelonix, Gir., parasitic on *Nemeophila cervini*, is specifically distinct from *examinator*, F., with which Sichel wrongly associates it: Fallou, Ann. Soc. Ent. Fr. (5) i. Bull. p. xxi.

Pimpla oculatoria, F. Laboulbène, Ann. Soc. Ent. Fr. (5) i. p. 444, has reared 6 ♀ of this sp. from eggs of *Epeira diadema*, at least 100 spiders being hatched from the remaining eggs of the nest.

Phytodietus pilosellus, Gr.: ♀ described: Giraud, *l. c.* p. 413.

Phytodietus microtamius, Gr. According to Tschek, *l. c.* p. 43, *Mesoleptus modestus*, Gr. (*Cryptopimpla*), is ♀ of this, the characters of the *Pimplides* and *Tryphonides* being thus united in one species.

Ephialtes hæmorrhoidalis, sp. n., Tschek, *l. c.* p. 37, Austria.

Pimpla ventricosa, sp. n., *id. l. c.* p. 40, Austria.

Lissonota artemisiæ, sp. n., *id. l. c.* p. 41, Austria, from larva of a beetle or of *Grapholitha pupillana*.

Echthrus populiæus, sp. n., Giraud, *l. c.* p. 407, Bourg-d'Oisans, Isère, parasitic upon *Saperda populnea*, from *Populus tremula*.

Xorides ægyptius, sp. n., Walker, *l. c.* p. 3, Cairo.

BRACONIDÆ.

Elasmosoma berolinense, Ruthé. Giraud, Ann. Soc. Ent. Fr. (5) i. p. 299, corroborates Ruthé's presumption that this sp. is myrmecophilous, as he has taken it plentifully with *Formica rufa* at Fontainebleau. The ♀ appeared to be absolutely in the ants-nest, and the males (which sex only he considers Ruthé to have described) were captured by sweeping the neighbouring herbage. In Styria, however, Giraud found the ♂ (unaccompanied by the ♀) in the nest.

Bracon tenuicornis, Wesm., bred from galls on *Triticum repens*: Moncreaff, Ent. v. p. 240.

Proterops nigripennis, Wesm., is parasitic on *Hylotoma atrata*: Giraud, *l. c.* p. 411.

Sigalphus curculionis, Fitch ('Country Gentleman,' Sept. 1859). Riley, iii. Rep. Ins. Mo. pp. 24-27, figs. 7 & 8, redescribes and figures this parasite of *Conotrachelus nenuphar* in its chief stages. According to him, Westwood is wrong in attributing 3 cubital areolets to the front wings in this genus.

New species :—

Elasmosoma viennense, Giraud, l. c. p. 301, Vienna.

Bracon kersteni, Gerstäcker, Arch. f. Nat. xxxvii. p. 356, Mombas; *B. sculpturatus* and *melanarius*, p. 3, *ardens*, *concolor*, *determinatus*, p. 4, *signifer*, p. 5, coasts of Red Sea; *congruus*, p. 4, *indecisus*, *xanthomelas*, *spilogaster*, p. 5, Cairo, Walker, l. c.

Phylax? nigricornis, Walker, l. c. p. 5, Harkeko.

Microgaster limenitidis, Riley, iii. Rep. Ins. Mo. p. 158, f. 73, U. S. A., parasitic on *Limenitis disippus* and *Gelechia gallæsolidaginis*.

CHALCIDIDÆ.

WALKER (London: 1871) publishes "Notes on Chalcididæ" [*sic*] under the following titles:—Part I. Eurytomidæ, pp. 1–18; Part II. Eurytomidæ and Torymidæ, pp. 19–36; Part III. Torymidæ and Chalcididæ, pp. 37–54; Part IV. Chalcididæ, Leucospidæ [*rectius* Leucaspidæ], Agaonidæ, Eucharidæ, Perilampidæ, Ormyridæ, and Encyrtidæ, pp. 55–70. At pp. 2 & 3 is a synoptical table of the British subfamilies.

To prevent confusion, these papers are here analyzed as a whole, adhering to the author's subfamilies.

Chalcidides.

The author, p. 39, combines *Hockeria*, *Phasgonophora*, *Euchalcis*, *Allocera*, and *Trigonura* under *Halticella* [*sic*], at the same time stating his belief of the probability of the spp. being partitioned among numerous new genera. He reproduces Sichel's arrangement of *Phasgonophora*, agreeing mostly with *Haltichella*. Spp. of *Chalcis* are geographically tabulated, p. 46; *C. alexion*, Walk., = *Chirocera femoralis*, Latr., = *pectinicornis*, id.; *Hippota*, Hal., not being necessary for the preoccupied *Chirocera*, which is, in the author's opinion, not separable from *Chalcis*. Spp. of *Smicra* are geographically tabulated, p. 50 *et seq.*; of *Epitranus*, p. 56. *Notaspis formiciformis*, Wlk., figured, p. 37.

Haltichella cincticornis, *fumipennis*, p. 42, Corsica; *nigricola*, p. 43, Gambia; *fasciicornis*, ib., *tarsalis*, *divisicornis*, p. 44, Bombay, *cineraria*, *subfasciata*, p. 45, Australia: spp. nn.

Chalcis pubescens, p. 47, Mexico; *varipes*, S. Africa, *semirufa*, Moulmein, p. 48; *mansueta*, ib., *alternipes*, *lugubris*, p. 49, Hong Kong; *opponens*, p. 50, Swan River: spp. nn.

Smicra conjungens and *pompiloides*, p. 53, Mexico, *decora*, p. 54, Brazil: spp. nn.

Torymides.

Synopsis of European genera and of European spp. of *Callimome* reproduced, pp. 27–33: general observations, doubtful synonymy, and figures of *Torymus caliginosus* and *Podagrion splendidum*, p. 19.

Odoipoia [*rectius* *Odopeæ*], g. n., p. 36: unites *Eurytomides* and *Torymides*. *O. atra*, sp. n. *ibid.*, Ceylon.

Torymoides, g. n., p. 37: allied to *Callimome*, but with its abdomen quite

sessile, slightly compressed, concave above, as long as thorax. *T. amabilis*, sp. n., p. 38, Ceylon.

Callimome strenua, England, and *divisa*, Spain, p. 34, spp. nn.

Megastigmus pistaciæ, sp. n., p. 35, S. France, Tuscany.

Ecdamua indica, sp. n., *ibid.*, Bombay.

Eurytomides.

Table of genera, p. 3; comparative characters (according to variation of structure in different parts) of British spp. of *Isosoma*, pp. 3-7. *Isosoma vitis* is considered to connect *Isosoma* and *Eurytoma*, and Walsh's opinion as to these genera and their parasitic or plant-eating habits are discussed, and other recorded evidence on this point is referred to, p. 20 [the author apparently leaving the question exactly where it stood before]. Certain European spp. of *Eurytoma* are tabulated, p. 21, and vague and unconnected remarks are made upon other members of the group, including the following quasi-corrections:—*Eurytoma abrotani*, B. M. List, ? = *tibialis*, Zett., *rubicola*, Gir., *E. guttula*, Z., ? = *Isosoma verticillatum*, *E. minuta*, Z., ? = *I. minus*, *Tetramera* may be united to *Eurytoma*; and some spp. of *Eurytoma* of Boh. and Först. are referred to *Isosoma*. *I. flavicollis* and *Eurytoma platyptera* figured, p. 1.

Philachyra, g. n., p. 7. *P. ips*, sp. n., p. 8, Lucca.

Aiolomorphus [rectius *Æolomorphus*], g. n., p. 12. Spurious veins well defined, but with little affinity to the *Leucaspides* or *Chalcidides*. *A. rhophaloides*, sp. n., p. 13, Hong Kong.

Sycophila, g. n., p. 63. To be placed next *Decatoma* until a new family is constituted for its reception. *S. megastigmoides* and *decatomoides*, p. 64, Hindostan, spp. nn.

Eurytoma insignis, p. 13, *melanoneura*, p. 14, *exempta* and *intermissa*, p. 23, England, spp. nn.

Isosoma clavicorne, *melanomorum*, p. 14, *claripenne*, p. 15, *æquale*, *tibiale*, p. 16, *juncum*, *robustum*, p. 24, England; *tenuipes*, p. 15, no locality; *canaliculatum*, p. 17, S. France; *lativentre*, *æquale*, p. 25, *anticum* and *subfumatum*, p. 26, Madeira: spp. nn.

Eucharides.

Genera and spp. enumerated, and *Stilbula volusus*, Wlk., figured, p. 65; *Schizaspidia furcata*, F., and *Eucharis iello*, Wlk., figured, p. 66.

Perilampides.

General observations, p. 69. *Perilampus hedychroides*, sp. n., p. 67, Ceylon.

Ormyrides.

Gen. obs. p. 68. *Ormyrus nigrocyaneus* = *punctiger*, var., *ibid.* *O. orientalis*, sp. n., *ibid.*, Ceylon.

Encyrtides.

Gen. obs. *ibid.* Förster's synopsis of genera reproduced, p. 69.

Leucaspides.

Gen. obs. p. 56. *Leucopsis* [rectius *Leucaspis*] *japonica*, p. 56, Japan, *australis*, S. Australia, *exornata*, Hong Kong, p. 57 spp. nn.

Agaonides.

Gen. obs. pp. 59 & 64. Coquerel's figs. of *Apocrypta* and *Sycocrypta* reproduced, p. 58 (these again reproduced, with an abstract of Walker's remarks, by Newman, Ent. v. p. 399 *et seq.*, under the absurd heading of "Answers to Correspondents"). *Chalcis* ? *explorator*, Coq., is an *Idarnes*, p. 60.

Sycobia, g. n., p. 60. Mandibles long and curved, as in *Scleroderma*, but more allied to *Sycocrypta*, though having eyes and wings. *S. bethyloides*, sp. n., p. 61, Hindostan.

Idarnes transiens, *stabilis*, p. 62, *pteromaloides*, p. 63, Hindostan, spp. nn.

Allocera, Sich. Parasitism on *Psyche* (Lepid.) recorded, and economy discussed; Lucas, Ann. Soc. Ent. Fr. (5) i. p. 12 *et seq.*

Eurytoma longipennis, Walk., is recorded by J. Ritsema, Tijdschr. Ent. (2) vi. p. 149, as reared from a gall of *Psamma arenaria*: cf. Arch. Néerl. v.; Ent. v. p. 264.

Isosoma: Walker (Zool. s. s. vi. p. 2429 *et seq.*) recapitulates published observations on habits, incidentally referring to other genera.

Decatoma mellea, Walk., *Pteromalus fulviventris*, W., and a sp. n. indicated under the name *festucae*, are reared by Moncreaff from stems of *Festuca ovina*; *Isosoma hyalipenne*, W., from galls on *Triticum repens*, and *Callimome macroptera*, W., from boat-shaped galls on *Prunus spinosus*, probably made by *Cecidomyia*: Ent. v. pp. 239 & 240.

Eupelmus: Giraud, Ann. Soc. Ent. Fr. (5) i. Bull. p. xviii, records the larva of a large sp. of this genus as devouring eggs of *Bombyx yamamai*, on the authority of Guérin-Ménéville.

Pteromalus cordairii, Ratz., = *Eupelmus degeeri*, Dalm., ♂: Giraud, *ibid.* i. p. 414.

Pteromalus puparum: a parasite on *Pieris rapæ*, dubiously referred to this sp., is recorded from N. America by Lintner, Am. Nat. v. p. 724.; cf. Canad. Ent. iii. pp. 158, 235.

Trichogramma evanescens, Westw., is parasitic on eggs of *Smerinthus populi*: Ent. v. p. 358.

Proglorin [better -is], g. n., Philippi, S. E. Z. xxxii. p. 288 (? = *Cerco-behus*, Hal., sec. auct.). *P. maculipennis*, sp. n., *id.* l. c. p. 289, Taf. iii. f. 3-3c, Valdivia, Chili.

Allocera unicolor, sp. n., Lucas, l. c. p. 16, pl. 1. f. 2-2d, Oran.

Chalcis insolita, sp. n., Walker, l. c. p. 6, Tajura.

Isosoma pitis, Saunders, i. Rep. Ins. Ont. pp. 109-111 (described and particulars of its injuries to grape-seeds given).

Eupelmus cicadæ, p. 413, Montpellier, from eggs of a *Cicada* (? *plebeia*, Scop.; cf. Réaumur, Mém. sur la Cigale, v. mem. 4, pl. ix. f. 14, who possibly refers to *E. memnonius*, Dalm.); *splendens*, p. 416, ? Montpellier, parasitic on *Buthyaspiis aceris*; and *bifasciatus*, p. 418, Vöslau, Lr. Austria, ? parasitic on *Zygæna*: Giraud, l. c., spp. nn.

Brachygaster ? *vuldiviana*, sp. n., Philippi, l. c. p. 289, Taf. 3. f. 4-4a, Valdivia, Chili.

Trichogramma (?) *minuta*: under this name Riley, iii. Rep. Ins. Mo. pp. 157-159, f. 72, refers to and figures an apparently new sp., parasitic upon the eggs of *Limenitis disippus*, in the Mississippi valley.

PROCTOTRYPIDÆ.

Myrmecomorphus rufescens is recorded from Dorsetshire by Dale (Pr. E. Soc. 1871, p. xxiv.) and from Leicestershire by Marshall (Ent. M. M. viii. p. 65).

CYNIPIDÆ.

MAYR, in the 2nd part of his work "Die mitteleuropäischen Eichengallen in Wort und Bild" (Vienna, 1871, 8vo, pp. 35-70, pls. v.-vii., from JB. Wien Kom. Oberrealsch.), describes and figures the galls of *Biorrhiza renum* and *synaspis*, Htg., *Dryophanta scutellaris*, Ol., *folii*, L. (nec Htg.), *longiventris*, *divisa*, *agama*, *disticha*, *cornifex*, Htg., *Andricus urniformis* (of which he describes the ♀, p. 39, note), Fonsc., *curvator*, *testaceipes*, *4-lineatus*, Htg., *multiplicatus*, *cydoniæ*, *nitidus*, *æstivalis*, *grossulariæ*, *amenti*, *glandium*, Gir., *ramuli*, L., *erispator*, *occultus*, Tschek, *pedunculi*, *flavicornis*, *ambiguus*, *glabriuseulus*, *verrucosus*, Schenck, *Neuroterus numismatis*, *lenticularis*, Ol., *fumipennis*, *ostreus*, Htg., *læviuseulus*, Schk., *lanuginosus*, *minutulus*, Gir., *salien*, Koll., *Spathogaster baccarum*, L., *tricolor*, Htg., *albipes*, Schk., *verrucosa*, *vesicatrix*, *taschenbergi*, Schlecht., *nervosa*, *glandiformis*, Gir., *Cynips caputmedusæ*, Htg., *calicis*, Burgsd., ? *C. marginalis* and *ramicola*, Schlecht., ? *seminationis*, Gir., *Aphilothrix albopunctata*, Schlecht. References are also made to *Synophrus politus*, Htg., ? *Cynips superfetationis*, Gir., *Aphilothrix radialis*, *corticis*, *globuli*, *elementinæ*. The following apparently original synonymy is given:—*Cynips tegmentorum* and *fasciata*, Schl., = *Aphilothrix collaris*; *Spathogaster giraudi*, Tschek, = *floseuli*, Gir., with which *verrucosa*, Schl., is possibly also identical; *Andricus petioli*, Htg., = *noduli*; *A. burgundus*, Schl., is a *Neuroterus*, and is named *schlechtendali*, p. 62 (redescribed, *ib.* note, figured T. vii. f. 87).

Evidence of the existence of parthenogenesis in the *Cynipidæ* is recapitulated and commented upon by v. Siebold 'Beiträge' &c. pp. 228-230.

Flight of *Cynips*: Walsh's remarks on this subject are discussed, and a personal experience recorded, by Rye, Ent. M. M. vii. p. 255.

Oak-galls from Morocco: *ef.* observations by Müller, Pr. E. Soc. 1871, p. ii.

Cynips ramuli: galls from the Drachenfels are referred to: *id.* Ent. M. M. vii. p. 254.

Cynips kollari: the migration in Gt. Britain northwards of this sp. is recorded by Jordan, *ibid.* viii. p. 51. Hardy (P. Berw. Nat. Club, 1871, p. 249) notes the occurrence of this gall in the Scotch border counties, and even in Scotland itself. He considers it was originally brought to the west of England in some ship, being common in the Channel Islands. It also occurs at Killarney.

Andricus curvator: for observations on its inner gall, *ef.* Müller, *l. c.* vii. p. 230.

Neuroterus ostreus is recorded as British: *id. ibid.* p. 209. An error in Ent. iv., wherein *N. reaumuri* is called *Neurobius*, corrected: *id. l. c.*, note.

Bathyaspis aceris: Giraud, Ann. Soc. Ent. Fr. (5) i. p. 416, notes the different galls of this sp. on *Acer monspessulanum*; those on the leaves enclosing parasites and not the *Cynips*, which is always found in the larger spherical galls, usually occurring at the end of a branch. He also makes some observations upon the ovipositing of this insect.

Diastrophus rubi: Müller, Pr. E. Soc. 1871, p. xx, refers to this species a gall found on *Pteris aquilina*.

Andricus singularis, Mayr, l. c. p. 68, note, T. vii. f. 95, Vienna; *A. occultus* (gall in ♂ bloom of *Quercus sessiliflora*) and *crispator* (gall on *Q. cerris*), Tschek, Verh. z.-b. Wien, xxi. pp. 797 & 798, Austria: spp. nn.

Figites inapertus, sp. n., Walker, l. c. p. 6, Cairo.

URO CERIDÆ.

Brachyxyphus, g. n., Philippi, S. E. Z. xxxii. p. 285: allied to *Xiphydria* (in spelling which the author notes that Latreille is right and Brullé, Lepelletier, Dumeril, and others are wrong), but with a short terebra, bicalcarate middle tibiæ, approximated antennæ, of which the 3rd joint is long, &c. (the author suggests that both of these genera belong to the *Tenthredinidæ*, on account of their long maxillary palpi). *B. grandis*, Taf. 3. f. 1-1f, *fluvipes*, f. 2-2b, p. 287, Valdivia, Chili: *id. l. c.*, spp. nn.

TENTHREDINIDÆ.

Athalia spinarum, *Cephus pygmæus*, *Emphytus grossulariæ*, *Ephippionotus compressus*, *Hoplocampa fulvicornis*, *Lyda nemoralis* and *pyri*, and *Nematus ventricosus*: Künstler (Verh. z.-b. Wien, xxi. Beih. pp. 44, 22, 77, 65, 83, 76 & 77) discusses injuries caused by these spp. to cultivated plants.

Van Vollenhoven, Tijdschr. Ent. (2) vi. pp. 237-254, pls. 10-12, gives a further small instalment of his "Inlandsche Bladwespen," by describing (with notices of economy) and figuring two new spp., and *Cryptocampus angustus*, Htg. (pl. 12. figs. 1-4), from stems of *Salix cinerea*, and *C. mucronatus*, Klug (*ib.* figs. a-d), from galls on twigs of *Salix*.

Lower-Harz district: Rudow (S. E. Z. xxxii. pp. 381-395) enumerates spp., describing some as new and giving a few synonyms.

London district: Healey (Ent. v. p. 365) gives a meagre list of spp.

Parasites: many *Ichneumonidæ* are enumerated by Brischke in Schr. Ges. Königsb. xi. p. 65 *et seq.*

The rarity of the male sex in many spp. of *Tenthredinidæ*, in connexion with parthenogenesis, is commented upon by v. Siebold, 'Beiträge' &c. pp. 226-228.

Lophyrus pini: the occurrence of an unexpected second brood of this sp. is recorded by Heylaerts, Tijdschr. Ent. (2) vi. p. 145. Tacchetti (Riv. sci.-ind.) refers to a successful method of getting rid of this pest by beating over sheets and the use of burning pitch.

Euura gallæ (Newman): under this name Healey (l. c. p. 366) refers to a gall-eater on *Vaccinium vitisidæa*, from Scotland.

Nematus ventricosus. v. Siebold, 'Beiträge' &c. pp. 106-130, and SB. bayer. Ak. 1871, p. 233, note, *et seq.*, gives details of exhaustive experiments on various broods, finally concluding that not only is this sp. capable of propagation by parthenogenesis, but, as in *Vespa* and *Polistes*, such parthenogenesis is associated with Leuckart's *arrhenotocy* (for which he proposes to adopt Breyer's term *androgenesis*, referring to the power possessed by the unimpregnated ova of producing male individuals). Stieda (SB. Ges. Dorp. iii. p. 133 *et seq.*) gives an account of its economy. Damages caused

by it at Quebec are recorded by Bowles (Canad. Ent. iii. p. 7), who has used dusted hellebore with effect.

Nematus ventralis: Tischbein (S. E. Z. xxxii. p. 353) describes and figures astonishing neural aberrations in the right fore wing of a ♂ of this sp.

Nematus vallisnerii is recorded by Müller (Ent. M. M. viii. p. 109) as depositing its eggs in a shoot of *Salix fragilis* covered with *Aphides*.

Selandria pubescens, Zadd., *lineolata*, Kl., *sec.* Zadd. (the ♂ of which is erroneously attributed to *pubescens* by Zaddach, and which, as a species, is in all probability only a syn. of *bipunctata*, Kl.), and *melanocephala*, F. (of which *albiventris*, Kl., is the ♂, as presumed by Klug): the economy of these spp., the spinose larvæ of which feed upon the oak, is detailed by Giraud, Ann. Soc. Ent. Fr. (5) i. pp. 380–386, who supplements Zaddach's observations, and adds a notice of another sp., *nigripes*, Kl., Htg., giving a list of Ichneumonidous parasites bred from these larvæ.

Selandria melanocephala and *Dineura albi*: May (Zool. s. s. vi. pp. 2478 & 2574) translates Vollenhoven's account of the economy of these spp.

Dineura pallipes, Htg., = *opaca*, Htg. (*var.*), *nec* F., = *punctigera*, Lep., = *verna*, Kl.: Giraud (l. c. p. 386), who notices aberrations in the neurulation of this sp., and describes its economy and parasites.

Dolerus luctuosus, Lep., = *Emphytus patellatus*, Kl., and the true habitat of its larva is apparently the pith of bramble-twigs: Puton, Ann. Soc. Ent. Fr. (5) i. p. 97.

Cephus tabidus: Taschenberg, Z. ges. Naturw. xxxviii. p. 306, describes ♂ and ♀ from I. Lesina.

Hylotoma claripennis, p. 382, *saliceti*, p. 383, *similis*, p. 384, Harz: Rudow, S. E. Z. xxxii., spp. nn.

Nematus consobrinus, p. 236, pl. 10. figs. 1–13, Leyden, Haarlem (closely allied to *ventricosus*, and probably identical with the undescribed *cylindricus*, Htg., *sec. auct.*), *lugdunensis*, p. 243, pl. 11. figs. 1–10, from galls on *Salix alba* and *purpurea* (♀ = *vallisnerii*, *var.*, *sec. auct.*): v. Vollenhoven, l. c., spp. nn. *Selandria virescens*, p. 394, Harz, *albomarginata*, p. 395, Dresden: Rudow, l. c., spp. nn.

Macrophya melanosoma, sp. n., *id.* l. c. p. 392, Harz.

Pachyprotasis tenuis, sp. n., *id.* *ibid.*, Harz.

Perineura cylindrica, sp. n., *id.* l. c. p. 390, Harz.

Tenthredo melas and *fasciata*, p. 386, *chloros*, p. 387, *explanata* and *seesana*, p. 388, Harz; *leucostoma*, Thuringia, *benthini*, Dalmatia, p. 389; *gynandromorpha*, p. 390, ♀ Harz: *id.* l. c., spp. nn.

Cephus helleri, sp. n., Taschenberg, l. c. p. 305, Innsbruck.

LEPIDOPTERA

By W. F. KIRBY, M.E.S. &c.

BERNHARDT, G. Die Schmetterlinge. Anleitung zur Kenntniss der Schmetterlinge und Raupen nebst Anweisung Schmetterlings- und Raupensammlungen zweckmässig anzulegen. Aufl. 5. Halle: 8vo, 1870, pls. 34.

Not seen by the Recorder.

BUTLER, A. G. *Lepidoptera Exotica*. Parts 7-10. Jan. to Oct. 1871. London: 4to, pp. 51-84, pls. 20-32.

DELERNE, G. Régénération des Vers à soie, et notamment des Vers à soie du Pays. Rapport présenté à la Chambre de Commerce de Lyon. Lyon: 1870.

Not seen by the Recorder.

ERSCHOFF, N. Bemerkungen über einige von E. Eversmann aufgestellte Lepidopteren-Species. Bull. Mosc. xliii. pp. 307-319.

Notes on the *Noctuæ*, *Geometræ*, and *Pyrales* described by Eversmann.

FREY, H. Ein Beitrag zur Kenntniss der Microlepidopteren. Mitth. schw. ent. Ges. iii. pp. 277-296; S. E. Z. xxxii. pp. 101-130.

Contains descriptions of 24 new or little-known species, and short notes on 48 others.

GROTE, A. R., & ROBINSON, C. T. Lepidopterological Notes and Descriptions. No. I. Proc. Ent. Soc. Phil. iv. pp. 489-496, pl. 3 (1865).

Appears to have escaped notice in previous volumes of Zool. Rec.

HABERLANDT, F. Die Aufzucht des Eichenspinners, *Antheræa yama-mai*. Vienna: 1871, 8vo, pp. 247.

Reviewed by Rein, Zool. Gart. xii. pp. 206 & 207. Not seen by the Recorder.

HEWITSON, W. C. *Exotic Butterflies*. Parts 77-80. Jan. to Oct. 1871. London: 4to.

KIRBY, W. F. A Synonymic Catalogue of Diurnal Lepidoptera. 8vo. London: 1871, pp. viii, 690.

Comprises full references to all the works on the subject, and a complete alphabetical index.

MILLIÈRE, P. Iconographie de Chenilles et Lépidoptères inédits, iii. livr. 23, 24. Ann. Soc. L. Lyon, xviii. pp. 1-80, pls. 101-108.

——. Catalogue raisonné des Lépidoptères des Alpes Maritimes. Bull. Soc. Yonne, 1871.

Not seen by the Recorder.

PACKARD, A. S. Injurious Insects new and little known. Ann. Rep. Mass. Board of Agric. 1870 (see Rec. Am. Ent. 1870, p. 8).

Not seen by the Recorder.

PEYERIMHOFF, H. DE. Lepidopterologische Notizen. Mitth. schw. ent. Ges. iii. pp. 409-415.

Contains notices of new or rare Micro-Lepidoptera.

PRITTWITZ, O. VON. *Lepidopterologisches*. S. E. Z. xxxii. pp. 237–253.

Besides shorter synonymic notes, this paper contains critical remarks on Felder's 'Reise der Fregatten Novara's,' Boisduval's 'Lépidoptères de la Californie,' Kollar's new *Lepidoptera* in Hügel's 'Kashmir,' &c.

ROBINSON, C. T. *Lepidopterological Miscellanies*.—No. 2. Ann. Lyc. N. York, ix. pp. 310–316.

A portion of this paper was noticed in Zool. Rec. vii.

——. [See GROTE, A. R.]

WALLENGREN, H. D. J. *Skandinaviens Heterocerfjärilar*. Del. ii. Spinnarne. Häft. 2. Lund: 8vo, 1871, pp. 137–256.

Contains the *Platypterygidae*, *Notodontidae*, *Cymatophoridae*, and *Arctioidae*, tribes *Nycteolidae*, *Cymbidae*, and *Nolidae*.

ZELLER, P. C. *Lepidopterologische Beobachtungen im Jahre 1870*. S. E. Z. xxxii. pp. 49–81.

GENERAL NOTES.

On the eggshells of *Lepidoptera* and their development, in reply to Waldeyer: W. von Nathusius, Z. wiss. Zool. xxi. pp. 325–329, pl. 24 B.

On protective and general variation in the colour of larvæ and on the egg-state, see Goossens, Ann. Soc. Ent. Fr. (4) x. Bull. pp. cxi, cxviii; *ibid.* (5) i. pp. x–xii.

On larvæ refused by birds: J. J. Weir, Nature, iii. p. 166.

On the claspers of young larvæ as affecting their classification, B. Lockyer, Ent. v. pp. 433, 434. He thinks the *Geometræ* should follow the *Noctuæ*.

SCUDDER, in an article "on the embryonic larvæ of Butterflies" (Ent. M. M. viii. pp. 122–126), shows that the larvæ of nearly all the principal groups of *Rhopalocera* differ more in structure from their adult condition, before the first moult, than do the adult larvæ of allied genera. These differences are not always in the same direction; but in every case the appendages vary greatly, and larvæ are never found to be furnished only with irregularly distributed minute simple hairs in infancy and regularly arranged special appendages at maturity.

On the internal anatomy of the larvæ of various *Lepidoptera* (chiefly *Bombyces*), see A. Targioni-Tozzetti, Bull. Ent. Ital. iii. pp. 392–406, pl. 3.

On the hibernation of tree-eating larvæ, see W. H. Harwood, Ent. M. M. vii. pp. 277 & 278.

F. Buchanan White gives a list of *Lepidoptera* which feed on Scotch fir: Scot. Nat. i. pp. 86 & 87.

The larvæ of several American moths are described by W. Saunders, Canad. Ent. iii. pp. 225–227.

The larvæ of the following species feed on plants of the genus *Bupleurum*: *Hypochalcia melanella*, *Aspilates gilvaria*, *Eupithecia pimpinellata*, *Depressaria bupleurella*, *D. amanticella*: Eppelsheim, S. E. Z. xxxii. pp. 317 & 318.

Egeria tipuliformis (imago figured), *Angerona crocataria*, *Grapta progne*, and *Amphidasys cognataria* feed on currants at Quebec: G. J. Bowles, Canad. Ent. iii. pp. 9-12.

On the coloration of pupæ, see Klinckel and Blanchard, Ann. Soc. Ent. Fr. (5) i. Bull. pp. lv & lvi.

Sexual selection: Darwin ('Descent of Man,' &c. vol. i. ch. xi. pp. 386-423) devotes a chapter to this subject as regards *Lepidoptera*. On the proportion of sexes, see Darwin, *l. c.* pp. 309-313, and R. Meldola, Nature, iii. pp. 508 & 509.

Mimicry, see Riley, iii. Rep. Ins. Miss. pp. 159-175; also Scudder, Butler, and Wallace, in Nature, iii. pp. 147, 165. On European species which mimic other insects, see Dietze, S. E. Z. xxxii. pp. 279-284.

Parthenogenesis: see G. A. Kornhuber, Schr. Ver. nat. Wien, v. pp. 368-371. Dohrn criticizes Weijenburgh's remarks on this subject. S. E. Z. xxxii. pp. 28-32.

H. LANDOIS, under the heading "Beiträge zur Entwicklungsgeschichte der Schmetterlingsflügel in der Raupe und Puppe" (Z. wiss. Zool. xxi. pp. 305-316, pl. 23), traces the gradual development of the wings of a Lepidopterous insect through all its changes from the newly hatched larva to the perfect insect, in a series of careful observations and experiments.

MAREX's observations on the action of the wings of butterflies during flight (*cf.* Zool. Rec. v. p. 177) are translated by Pettigrew, Tr. R. Soc. Edinb. xxvi. pp. 359-362.

R. L. MADDOX publishes "Remarks on the General and Particular Construction of the Scales of some of the Lepidoptera, as bearing on the Structure of the 'Test-Scale' of *Lepidocyrtus curvicolis*" (M. Micr. J. v. pp. 247-266, pls. 86-88; discussion, pp. 278, 279)—an elaborate paper on a subject now exciting much interest among microscopists, with useful hints for further investigation. From it, the scales of *Lepidoptera* would appear to be more nearly analogous to the feathers of birds than has hitherto been supposed.

S. J. McINTIRE remarks on the microscopic appearance of the scales of certain *Lepidoptera*. Those of *Urania leilus*, *Pieris agathina*, and *P. epicharis* are figured: *ibid.* pp. 4-8, pls. 70 & 71.

On the colouring of the scales of butterflies, see Pr. E. Soc. 1871, pp. xviii. xxiii. xxiv.

On the ocelli of *Lepidoptera*, with figures of the varr. of *Cylo leda*, see Darwin, Descent of Man, ii. pp. 132-134.

FALLOU remarks on the influence of hot and dry seasons in producing arrest of development. Ann. Soc. Ent. Fr. (4) x. Bull. p. lxxx.

Female moths seldom come to sugar; and those which do so are mostly unimpregnated: J. R. S. Clifford, Ent. v. p. 460.

Various malformations are recorded in Pr. E. Soc. 1871, pp. ii. iv. vii. xviii. xxxi. xli.

FALLOU, Ann. Soc. Ent. Fr. (5) i. pp. 99-108, pl. 2, describes and figures abnormal specimens collected in the Valais during July, 1870.

On cryptogamous parasites infesting the imagos of *Sphinx eson*, *Noctua*

xanthographa, and *Euchelia jacobææ*, see Goossens and Fallou, *ibid.* Bull. pp. lvii & lviii.

Brefeld's work, referred to in "General Subject," contains the full history of a fungus which infests the larva of *Pieris brassicæ*.

KÜNSTLER (see "General Subject") publishes many valuable notes on *Lepidoptera* injurious to cultivated plants, and the means of destroying them.

On various *Lepidoptera* injurious to the crops in Italy, see Apelle Dei, Bull. Ent. Ital. iii. pp. 71, 75, 360-365.

On recorded swarms of *Vanessa cardui*, *Pontia cratægi*, and *Pieris brassicæ*, see Köppen, S. E. Z. xxxii. pp. 189, 190.

On geographical distribution, with special reference to Boisduval's 'Lépidoptères de Californie,' see Prittwitz, *ibid.* pp. 245-250.

GREAT BRITAIN. R. C. R. Jordan (Ent. M. M. viii. pp. 45-52) discusses the origin of the British *Lepidoptera*, and classifies them into (1) Migrants of the glacial epoch; (2) Migrants of a warmer postglacial epoch; (3) Direct migrants; (4) Western migrants; (5) Autochthones; (6) Naturalized species. Under each division representatives are mentioned, and general remarks of great interest added. A full list is appended of *Lepidoptera* as yet only taken in Great Britain.

Notes on *Lepidoptera*, by W. Herd, Scot. Nat. i. pp. 115 & 116.

H. G. Knaggs, in "Notes on new and rare British *Lepidoptera* (excepting *Tineina*) in 1871" (Ent. Ann. 1872, pp. 107-121), records 9 new British species.

For a rambling paper on entomology and other things at York, and chiefly devoted to *Lepidoptera*, cf. Birchall, Ent. v. pp. 390-392.

A list of Malvern *Lepidoptera*, as far as the genus *Tæniocampa*, is published by E. Horton, Tr. Malv. Club, iii. pp. 175-184.

A list of *Lepidoptera* occurring near Leominster and at Whitfield is given in Tr. Woolh. Club, 1870, pp. 256-265.

New or rare Scotch *Lepidoptera* are recorded in Scot. Nat. i. pp. 9-118.

F. Buchanan White, in 'Fauna Perthensis, or Contributions towards a Knowledge of the Animals inhabiting Perthshire,' pt. i. (Perth: 1871, 4to, pp. 31, map), has published a catalogue of the *Lepidoptera* of Perthshire, preceded by general remarks on the topography, geology, climate, and rainfall of the county. He gives a table of the number of species occurring in different latitudes in Britain, showing a steady decrease northwards. The proportion of moths to butterflies in Britain is $31\frac{5}{7}$ to 1; and, as there are 31 butterflies in Perthshire, there should be $963\frac{2}{3}$ moths, or $497\frac{1}{4}$ *Macrolepidoptera* (including the *Pyrales* and *Crambi*) and $499\frac{1}{2}$ *Microlepidoptera*. The total number of *Lepidoptera* (exclusive of *Tortrices*, *Tineæ*, and *Pterophori*) at present recorded as inhabiting Perthshire is 451, out of the above 497. The *Tortrices*, although imperfectly known, number 107; the *Tineæ* and *Pterophori* are not included in the present work. The influences of food-plant, climate, latitude or altitude, and locality, on distribution, variation, &c., are briefly touched upon.

For a list of *Lepidoptera* of Ayrshire, with remarks, cf. J. P. Duncan, Scot. Nat. i. pp. 74-78.

Birchall, Ent. M. M. viii. pp. 6-8, enumerates 30 species (some rather doubtful) added to the Irish fauna since the publication of his list of the *Lepidoptera* of Ireland.

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Lists of captures are published by O. G. Barrett, at Brandon and in the Fens (Ent. M. M. vii. pp. 197-200, 277-279); by E. N. Bloomfield, at Guestling (*op. cit.* p. 277); by D. T. Button, on Kent and Essex coasts (Ent. v. p. 393); by R. Cowper, at Sidmouth (Ent. M. M. viii. p. 166); by C. W. Dale, at Glanville's Wootton (*op. cit.* p. 139); by T. W. Daltrey, at Sherwood Forest (Ent. v. pp. 364 & 365); by J. B. Hodgkinson, at Witherslack (Ent. v. pp. 437-439); by A. E. Hudd, in S. Wales (Ent. M. M. viii. p. 113); by T. Hutchinson, at Leominster and Rannoch (*op. cit.* vii. p. 277, viii. pp. 112 & 113; Scot. Nat. i. p. 117); by J. H. Jenner, at Lewes and Battle (Ent. M. M. vii. pp. 213 & 214); by E. Kaye, in Carmarthenshire (*op. cit.* pp. 233 & 234); by B. Lockyer, in the New Forest (*op. cit.* viii. p. 139, and Ent. v. pp. 439 & 440); by W. Machin, at Southend, Epping, Loughton, &c. (Ent. v. pp. 279 & 280, 393 & 394, 440 & 441); by W. O. Marshall, in Cornwall (Ent. v. pp. 244 & 245); by G. Parry, at Canterbury (Ent. v. pp. 394 & 395); by E. T. Porritt, at Huddersfield and Sherwood Forest (Ent. M. M. vii. pp. 234 & 235, viii. pp. 88 & 89); by W. Prest, at York (*op. cit.* vii. p. 256); by W. D. Robinson, in Kircudbrightshire (Ent. v. pp. 230-232); by F. A. Walker, in Scilly (Zool. s. s. 1871, p. 2841); by F. B. White, in S.E. of Scotland (Ent. M. M. viii. pp. 66-68).

BELGIUM. New or rare species are recorded, Ann. Ent. Belg. xiv. c.-r. pp. 2-61.

HOLLAND. New Dutch *Microlepidoptera* are recorded by H. W. de Graaf and P. C. T. Snellen, Tijdschr. Ent. (2) vi. pp. 252-256; and other Dutch *Lepidoptera* by Heylaerts, *ibid.* pp. 38, 39, 144, 145, 182-185.

SWITZERLAND. Captures recorded by R. P. Murray (Ent. M. M. vii. pp. 257-260).

GERMANY. R. C. R. Jordan records captures at the Drachenfels (*ibid.* pp. 174-179).

A. Kuwert, in "Einiges über den Noctuiden-Köderfang, und die Flugzeit der in Ostpreussen durch demselben beobachteten Falter aus dem Sommer 1870," (S. E. Z. xxxii. pp. 212-219), records 131 species of East-Prussian *Macrolepidoptera*, adding notes on collecting.

Krause, "Ueber einige Schmetterlinge der Umgegend von Altenberg" (*ibid.* pp. 296-304), gives short notes on 66 *Macro-* and *Microlepidoptera*.

J. Munn, in "Beitrag zur Kenntniss der Lepidopteren-Fauna des Glockner Gebietes, nebst Beschreibung drei neuer Arten" (Verh. z.-b. Wien, xxi. pp. 69-82) describes 3 new species of *Microlepidoptera*.

A. Hartmann, 'Die Kleinschmetterlinge des Umgegend Münchens, und eines Theiles des bayerischen Alpen' (8vo, pp. 96, Munich: 1871), enumerates 728 species from Munich and the Bavarian Alps, with remarks. The preface includes instructions for killing and setting *Microlepidoptera*, and for rearing *Psychidæ* (*cf.* S. E. Z. xxxii. pp. 164-166).

SICILY. For account of captures by E. P. Wright on Mount Etna, *cf.* P. Dubl. Soc. v. pp. 300 & 301; and by E. Ragusa at Madonia, *cf.* Bull. Ent. Ital. iii. pp. 366-380.

RUSSIA. N. Erschoff, Bull. Mosc. xliii. pp. 303-305, makes additions to the faunas of Moscow and Omsk.

A. Becker, *ibid.* pp. 298-300, records species from Tamir Chan, Schera, and Derbent.

THIBET. E. Blanchard (C. R. lxxii. pp. 809-811) remarks on a small collection formed by the Abbé Armand David in the province of Moupin, and characterizes, far too briefly, a few species as new.

NORTH AMERICA. Notes on Nova-Scotian species, by Bethune & Jones, P. N.-Scot. Ins. ii. pp. 178-189 (Rec. Am. Ent. 1869, pp. 20-29); and on species from Lakes Huron and Superior, by C. J. S. Bethune, Canad. Ent. iii. pp. 81-84.

G. J. Bowles (*ibid.* pp. 144 & 145) has also published a list of *Sphingidæ*, *Sesiidæ*, *Zygenidæ*, &c. taken at Quebec, with short notes on the species.

SOUTH AMERICA. Von Noleken publishes notes on species (principally *Tineina*) observed by him in different parts of the West Indies and New Granada, S. E. Z. xxxii. pp. 259-267, 310-314.

A. R. Grote (Tr. Am. Ent. Soc. iii. pp. 183-188) gives a list of the *Sphingidæ*, *Ægeriidæ*, *Zygenidæ*, and *Bombycidæ* of Cuba.

A. S. Packard remarks on a few moths collected by Hauxwell at Pebas, Ecuador : Rep. Peab. Ac. ii. & iii. pp. 85-87.

AFRICA. R. Trimen (P. L. S. xi. pp. 280-284) notes as inhabitants of St. Helena, *Danaüs chrysippus*, *Pyrameis cardui* (which probably also occurs at Ascension), *Lycæna batista*, *Diadema misippus*, *Acherontia atropos*, *Achæa melicerta*, *Ophiodes hottentota*, *Hymenia recurvalis*, and *Botys otreusalis*. He also gives a list of insects captured at sea, and remarks on stinging and venomous larvæ, and on the geographical relations of African *Lepidoptera*.

For a list of species observed at Ramleh, near Alexandria, by O. Schneider, cf. SB. Ges. Isis, 1871, pp. 54 & 55.

A. Gerstäcker publishes a list of *Lepidoptera* from Zanzibar, and describes several new species : Arch. f. Nat. xxxvii. pp. 357-361.

On a small collection of Butterflies from Angola, see Butler, P. Z. S. 1871, pp. 721-725.

NEW ZEALAND. For some notes on the *Lepidoptera* of Otago, by A. Bathgate, cf. Tr. N. Z. Inst. iii. pp. 137-141.

Moth-trap. See Valette, Ann. Soc. Ent. Fr. (5) i. Bull. pp. lxxxiv & lxxxv, Canad. Ent. iii. pp. 194 & 195, and C. A. Shaw, Ent. M. M. vii. p. 276.

Sugaring. See F. B. White, Scot. Nat. i. pp. 29-35.

On pinning *Microlepidoptera*, cf. Pet. Nouv. iii. no. 35.

H. G. Knaggs has published a second edition of his 'Lepidopterist's Guide,' with many illustrations of a practical nature.

Staveley's 'British Insects' (see General Subject), ch. 20-22, pp. 255-295, pls. 10 & 11, contains a brief popular account of the principal groups of *Lepidoptera* and of their transformations.

In Wood's 'Insects at Home' is an introduction to the British *Lepidoptera* (pp. 381-530, pls. 13-17), with descriptions and figures of a considerable number of species. The work is illustrated with numerous woodcuts in addition to the plates.

The same author has published a popular work likely to be useful to beginners, entitled 'The Common Moths of England' (12mo, London: 1871, pp. 154, woodcuts and 12 plain or coloured plates).

An anonymous popular work, entitled 'Curiosities of Entomology,' contains the following chapters on *Lepidoptera*, each illustrated with a well-executed coloured plate:—"The *Microlepidoptera*, or Leaf-miners," pp. 25-

82; "The *Coleophora* [*sic*], or Tent-makers," pp. 33-38; "Mimetic Analogy, illustrated by South-American Butterflies," pp. 44-50; "Insect Disguises," pp. 51-54; "The Oak-feeding Silkworm of China" [*Antheræa perni*], pp. 55-59; "Insects' Eggs," pp. 60-63.

STAUDINGER & WOCKE have issued a new edition of their 'Catalog der Lepidopteren des europaischen Faunengebiets' (roy. 8vo, Dresden: 1871, pp. xxxviii, 426), in which localities are added. Many new varieties are named (too numerous to be here enumerated) and a few new genera and species named and characterized (*cf.* Pet. Nouv. iii. p. 167). It is reviewed at length, with many interesting observations on geographical distribution, by A. Breyer and P. de Borre, Ann. Ent. Belg. xiv. c.-r. pp. 125-135.

HERRICH-SCHÄFFER has commenced a 4th edition of his 'Systematisches Verzeichniss der Schmetterlinge von Europa,' the first sheet of which only, issued with C.B. Ver. Regensb. xxv., has come to the Recorder's hands.

E. B. Reed continues his accentuated list of Canadian *Lepidoptera*, Canad. Ent. iii. pp. 95 & 96.

W. A. Lewis, in a paper entitled "An examination of the arrangement of *Macrolepidoptera* introduced into England by Mr. Doubleday, with a suggestion as to its origin, with some strictures upon synonymic lists," severely criticizes the received arrangements of British *Lepidoptera*, and the lists and other works of Doubleday, Knaggs, and Newman. He maintains that no changes in nomenclature should be made in synonymic lists, and that no current name, whether it has the right of priority or not, should be superseded by an obsolete one. Tr. E. Soc. 1871, pp. 317-352; Pr. E. Soc. 1871, pp. xv-xviii. [See also the "General Subject."]

ZELLER publishes a series of notes on various *Heterocera* in a criticism of Taschenberg's 'Entomologie für Gärtner und Gartenfreunde,' S. E. Z. xxxii. pp. 166-175. He also (*l. c.* pp. 175-179) notices Rep. Ins. Miss. i.

Grote (Tr. Am. Ent. Soc. iii. pp. 173-176), in "Remarks on Dr. Boisdual's Lépidoptères de la Californie," gives some critical notes also on *Heterocera*.

Bremen's 'Lepidopteren Ostsibiriens' is reviewed, and the plates are severely criticized, in S. E. Z. xxxii. pp. 162-164.

The new species described by Staudinger in B. E. Z. xiv. are enumerated, with notes on their affinities, in Bull. Ent. Ital. iii. pp. 205-210.

On the dates of publication of Felder's 'Reise der Fregatten Novara's: Lepidopteren,' see Butler, Ann. N. H. (4) viii. pp. 290 & 291; and of Cramer and Stoll's 'Papillons Exotiques,' see W. F. Kirby, Pr. E. Soc. 1871, pp. xlv & xlv.

KOCH argues, on somewhat unsatisfactory grounds, that Cramer was not acquainted with any Australian *Lepidoptera*: S. E. Z. xxxii. pp. 239-241.

A. R. WALLACE protests against the revival of Hübner's generic names: Pr. E. S. 1871, pp. lxxv-lxxvii [*cf.* Zool. Rec. vii. p. 375].

Goedartius. G. Roberts publishes extracts from Lister's edition: Zool. s. s. 1871, pp. 2787-2790.

RHOPALOCERA.

Of W. H. EDWARDS'S 'Butterflies of North America' parts 7-9 have now appeared (Philadelphia: 4to, Jan., Aug., and Dec. 1871), the appended synopsis extending to the genus *Eumæus*.

G. RAMUM has commenced a popular work, entitled 'Die Schmetterlinge

Deutschlands nach der Natur gezeichneten Abbildungen' (Hft. i. Arnstadt: 1871, sm. fol. pp. 16, pls. 1 & 2), the first part of which contains figures of *Papilionidæ* and *Pieridæ*.

Newman's 'Illustrated Natural History of British Butterflies' (8vo, London: 1871, pp. xvi & 176, woodcuts) is now completed [*cf.* Zool. Rec. vii. p. 368].

A reprint of H. G. Adams's 'Beautiful Butterflies' &c., a popular work, first published in 1854, has been issued (8vo, London: 1871, 8 coloured plates).

For general observations on the habits and structure of Butterflies, *cf.* C. Hope-Robinson, Pop. Sc. Rev. x. pp. 52-57, pl. 69.

Papilionides.

Papilio ajax, L. Edwards, *l. c.* ix. *Pap.* pls. 1-3) figures in all stages var. *walshi*, Edw. (= *ajax*, Boisd. & Lec., text, = *marcellus*, Cr.), and describes sub-var. [!] *abboti*, Edw. (= *ajax*, Abb. & Feld.). He also figures in all stages var. *telamonides*, Feld. (= *ajax*, Godt., Boisd. & Lec., plate), and *marcellus*, Boisd. & Lec., Feld. (= *ajax* [Linn.], Esp. & Hübn.). There is a very interesting discussion on these forms, which Edwards has succeeded in referring to one species. See also *Canad. Ent.* iii. p. 70.

P. crino. A specimen from Ceylon, with the 1st and 2nd branches of median vein coated with brown hairs, is recorded by Westwood, *Pr. E. Soc.* 1871, p. xxxvi.

P. philenor. Transformations figured and described by Riley, *Rep. Ins. Miss.* ii. pp. 116-118.

P. podalirius, L. This name has priority over *P. sinon*, Poda: Kirby, *Pr. E. Soc.* 1871, p. xxi.

Parnassius. Edwards (*l. c.* vii. *Parn.* pl. 1) figures *P. clodius*, Mén., and *P. clarius*, both from California. [The species figured as *P. clarius* is not Eversmann's Siberian insect, but probably = *clodius*, *teste* Edw. *in litt.*]

Armandia, g. n., near *Thais*. Blanchard, *C. R.* lxxii. p. 809, note 3. Type *A. thaidina*, sp. n., *ibid.*, Thibet. [Certainly a *Sericinus*, probably = *S. montela*, Gray, ♀, var.].

Papilio crespontinus, p. 34, Ribé, E. Africa, *andronicus*, p. 121, Camaroons, Ward, *Ent. M. M.* viii.; *P. hercules* and *horatius*, Blanchard, *l. c.* p. 809, note 2, Thibet: spp. nn.

Pierides.

W. F. KIRBY, *Cat. D. Lep.*, proposes the name *chippewa* (Edw., MS.) for (*Colias*) *helena*, Edw. (*nec* H.-S.), from Mackenzie's River, p. 495; *hewitsoni*, for (*Idmais*) *chrysonome*, Doubl. & Hew. (*nec* Klug), = *C. vesta*, Trim. (*nec* Reiche), from Africa, p. 498; *esperii* for (*Euchloe*) *belia*, Esp. (*nec* Hübn.), = *ausonia*, Ochs. (*nec* Hübn.), = *ausonia*, Hübn., var., from S. Europe and N. Africa, p. 506.

Perente latona and *Hesperocharis idiotica*, Butl., figured, *Lep. Ex.* pl. 27, fig. 3, and pl. 28. fig. 2.

Leptalis lygdamis, Hew. (*pappa*, Plötz, MS.), = *hyposticta*, Feld., ♂: Prittwitz, *S. E. Z.* xxxii. pp. 241 & 242, who also describes the insect.

Terias. Butler publishes a revision of the species formerly included

in this genus, and refers them to his new genera. P. Z. S. 1871, pp. 526-541.

Neophasia menapia, Feld., is figured by Edwards, l. c. viii. *Neophasia* and *Pieris*, pl. 1. f. 1-3.

Pieris creona, Cr., 361 G, H, is a dark-coloured var. of *teutonia*, F.: Koch, S. E. Z. xxxii. p. 240. *P. periclea*, Feld., = *lanassa*, Boisdu.: Prittwitz, *ibid.* p. 242.

Pieris vernalis and *virginiensis*, Edw., are figured, Butt. N. Amer. pt. viii. *Pieris*, pl. 2; *P. protodice*, *oleracea*, and *rapæ* are figured in different stages, and their habits described, by Riley, Rep. Ins. Miss. ii. pp. 104-110. On the introduction of the latter species into Canada, see Canad. Nat. (n. s.) iv. pp. 293-300 (Rec. Am. Ent. 1869, p. 17); and on its parasites, Canad. Ent. iii. pp. 158, 197, 235.

Belenois cynis, Hew. Butler describes and figures a var.: Tr. E. Soc. 1871, p. 171, t. 7. f. 1.

B. sabrata, Butl., = *thysa*, Hopff.: *id.* P. Z. S. 1871, p. 725.

Phrissura, Butl. The true type is *Pieris illana*, Feld. (a form of *P. polisma*, Hew.), and not *P. cynis*, formerly given as the type, which is a true *Belenois*: *id.* Tr. E. Soc. 1871, p. 171.

Delias. Butler (Lep. Ex. pl. 24) figures his *D. ithiela*, f. 1, *lucerna*, f. 2, 3, *ochreopicta*, f. 4, 5; and *fragalactea* (= *argenthona*, var. ?), f. 7.

Callidryas. Butler, *ibid.*, continues his monograph of this genus, and figures the following known species:—*C. thaurama*, *florella*, and *eubule*, pl. 22. f. 3-6, 1, 2, & 2a, 7-10; *sennæ* and *drya*, pl. 23. f. 1-4, 5-8; *irriguata*, *neocypris*, and *cypris*, pl. 26. f. 1 & 2, 3-6, 7-10; *virgo* and *rudina*, pl. 29. f. 1-4, 5-8.

Papilio volcanica, Perry, Arcana (1811) = *Callidryas larra*, F., ♀: *id.* Ent. M. M. viii. p. 167.

Colias hyale, L., = *Pap. croceus*, Fourc. = *C. edusa*, F.; and *C. hyale*, auct., must take the name of *sareptensis*, Staud.: Kirby, Pr. E. Soc. 1871, pp. xlv & xlvi.

C. occidentalis, Edw., is figured: Butt. N. Amer. pt. vii. *Col.* pl. 3.

Ixias. Butler (P. Z. S. 1871, pp. 252-254) has published a revision of the species of this genus. He admits 15, of which 2 are new, and figures *I. venatrix*, Wall., pl. 19. f. 1.

Anthocharis cardamines: ♀ with partial colouring of ♂. Fallou, Ann. Soc. Ent. Fr. (5) i. pp. 369 & 370, pl. 5. figs. 7, 8.

Anthocharis sara, Luc., figured by Edwards, Butt. N. Amer. pt. vii. *Anth.* pl. 2.

New genera and species:—

Scalidoneura, Butler, P. Z. S. 1871, p. 250. Near *Colias*. Type *S. hermina*, sp. n., l. c. p. 251, pl. 19. fig. 5, E. Peru.

Larinopoda, *id.* Tr. E. Soc. 1871, p. 172. Allied to *Euchloe*. Type *L. lycanoides*, sp. n., l. c. p. 173, pl. 7. f. 2-5, W. Africa.

Hesperocharis fulvinota, *id.* Ann. N. H. (4) viii. p. 284, Rio.

Leptalis cinerascens, Costa Rica, Chiriqui, and *oreas*, Calobre, Veragua: Salvin, *ibid.* vii. pp. 415 & 416.

Terias memulus, Butler, P. Z. S. 1871, p. 251, pl. 19. fig. 6, Haiti; *T. reticulata*, *id.* l. c. p. 539, Archidona.

Pieris rhodanus, p. 58, *cebrón* and *capricornus*, p. 59, Ward, Ent. M. M. viii., Camaroons; *P. beckeri*, Edwards, Butt. N. Amer. pt. viii. *Neophasia* and *Pier.* pl. 1. f. 4-7, California; *P. calyce*, *id.* Tr. Am. Ent. Soc. iii. p. 189, Nevada.

Belenois meldolæ, Butler, P. Z. S. 1871, p. 725, Angola.

Delias inferna, *id.* Lep. Ex. i. p. 63, pl. 24. f. 6, N.W. Australia.

Eronia verulanus, Ward, l. c. p. 59, Camaroons.

Callidryas fornax, Chili, and *jārestia*, Para (= *C. wallacii* ♀?), Butler, Tr. E. Soc. 1871, pp. 170 & 171.

Cricogonia fantasia, *id. ibid.* p. 170, pl. 7. fig. 6, Nicaragua.

Rhodocera amintha and *alvinda*, Blanchard, C. R. lxxii. p. 810, note 1, Thibet.

Colias imperialis, Butler, P. Z. S. 1871, p. 250, pl. 19. fig. 2, Port Famine?; *C. meadi*, Edwards, Tr. Am. Ent. Soc. iii. p. 267 [hab. — ?].

Ixias venatus, Butler, Tr. E. Soc. 1871, p. 169, pl. 7. f. 7, White Nile; *I. undatus*, Labuan, and *latifasciatus*, *id.* P. Z. S. 1871, p. 252, pl. 19. figs. 4 & 5.

Callosune casta and *hetæra*, Gerstäcker, Arch. f. Nat. xxxvii. p. 357, Zanzibar.

Teracolus loandicus and *interruptus*, Butler, P. Z. S. 1871, p. 724, Angola.

Euchloe limonea, *id.* Tr. E. Soc. 1871, p. 172; Lep. Ex. pl. 27. f. 1, México.

Anthocharis byantis, California, *olympia*, Virginia, Texas: Edwards, Tr. Am. Ent. Soc. iii. pp. 205, 266.

Danaides.

W. F. KIRBY, Cat. D. Lep., proposes the name *badoura* for (*Euplexa*) *superba*, Voll., nec Hbst., from Celebes, p. 16, and *johanna* for (*E.*) *crameri*, Moore, nec Luc., from Borneo, p. 17.

Hestia belia, Westw. Quädvlieg figures a specimen with abnormal neuuration: Ann. Ent. Belg. xiv. pp. 74 & 75, pl. 2.

Danaïs archippus. Described and figured in all stages by Riley, Rep. Ins. Miss. iii. pp. 143-152. It occurs in Queensland, Ent. M. M. viii. p. 17. On its abundance in N. America in 1871, cf. Canad. Ent. iii. pp. 156-158.

Butler figures his *Danaïs leonora* and *ishma*, and *Amaturis vasleti*, Lep. Ex. i. pl. 20. figs. 2 & 3, pl. 21. fig. 1.

Amaturis inferna, sp. n., Butl. P. Z. S. 1871, p. 79, W. Africa.

Danaïs mo, sp. n., *id. ibid.*, Sula.

Heliconiides.

W. F. KIRBY, Cat. D. Lep., proposes the generic name *Aprotopus* for *Thyridia*, pt., Doubl. nec Hübn., type *T. ædesia*, D. & H., p. 19; and *Scada* for *Mechanitis*, sect. *Oleria*, Bates, nec Hübn., type *O. theaphia*, Bates, p. 23.

Ithomia. Hewitson (Ex. Butt. 77) figures his *I. alphesibæa*, *epöna*, *tidea*, *alissa*, *lamia*, *tigidella*, *thabena*, and *ægineta*, *Ith.* 28. figs. 178-185; *phagesia* and *amilia*, *Ith.* 29. figs. 186 & 187; *achæa*, *æthra*, *antonia*, *mantercus* (= *mansuetus*, var. ?), and *varina*, figs. 189-193.

Heliconia. Hewitson (l. c. 78, *Hel.* 6. f. 17-21) figures his *H. cythera*, *alitheia*, *unimaculata* (= *notabilis*, var. ?), *hierax* (= *himera*) and *timareta*.

H. doris. On its variation, see Bar, Pet. Nouv. iii. p. 156.

Papilio phalæna, Perry, Arcana (1810) = *Heliconia phyllis*, F.: Butler, Ent. M. M. viii. p. 167.

Ithomia albida, sp. n., Hewitson, Ex. Butt. 77, *Ith.* pl. 29. fig. 188, New Granada.

Melinæa scylax, Bugaba, Chiriqui, *orestes*, Peru, *cydippe*, Ecuador, Peru: Salvin, Ann. N. H. (4) vii. p. 412: spp. nn.

Heliconius sisypheus, Peru, Cosnipata, *venustus*, Apolobamba, p. 413, *etylus*, Ecuador, *montanus*, Costa Rica, *pochinus*, Chiriqui, *sotericus*, Ecuador, p. 414: *id. l. c.*, spp. nn.

Acræides.

Acræa satis, Ribé, E. Africa, p. 35, *pentapolis* and *peneleos*, p. 60, *polydectes* and *pharsalus*, p. 81, Camaroons: Ward, Ent. M. M. viii., spp. nn.

Nymphalides.

W. F. KIRBY, Cat. D. Lep. p. 178, proposes the superfluous generic name *Coatlantona* for *Chlosyne*, Butl. (= *Synchlœ*, Doubl., *nec* Hübn.); he also proposes the name *Anemeca* for *Morpheus*, Hübn. Samml. *nec* Verz., type *M. ehrenbergi*, Hübn., p. 179; *Peria* for *Pelia*, Doubl., preoccupied in *Crustacea*, type *Papilio lamis*, Cr., p. 205; *Mesotænia* for *Callitænia*, Feld., a correction proposed by Agassiz for *Calotænia*, preoccupied in *Lepidoptera*, type *C. doris*, Feld., p. 209; *Lincoya* for *Antigonis*, Feld., *nec* *Antigonus*, Hübn., type *Cybdelis pharsalia*, Hew., p. 649; *Vila* for *Olina*, Westw., preocc. in *Diptera*, type *O. azeca*, Doubl. & H., p. 217; *Catuna* for *Euomma*, Feld., preocc. in *Coleoptera*, = *Iæra*, Hübn., and *Iæra*, Westw., the former of which is employed by Agassiz for *Gæra*, preocc. in *Crustacea*, type *E. angustatum*, Feld., p. 238, and *livius* (referred to *Megalura*) for (*Timetes*) *berania*, Hew., fig. 2, *nec* fig. 1, p. 221.

STAUDINGER, Cat. Lep. Eur. p. 17, proposes the name *Thaleropsis* for an uncharacterized genus of which *Vanessa ionia*, Ev., is considered the type.

BUTLER (Lep. Ex.) figures his *Godartia ansellica*, pl. 20. fig. 1, *R[h]omaleosoma lakuma* and *Philognoma ussheri*, pl. 21. figs. 2 & 3; also *Euryphene mardania*, F., pl. 28. figs. 2 & 3, and *R[h]omaleosoma ceres*, F., var., pl. 31. fig. 1.

Colenis aleyonea and *cyllene*, Cr., are probably local or dimorphous forms of one species. Keferstein, S. E. Z. xxxii. pp. 326, 327.

Argynnis niobe and *adippe* have been taken *in cop.* by Druce in Switzerland. Butler, Ent. M. M. viii. p. 166.

A. adippe. Aberration described by Girard, Ann. Soc. Ent. Fr. (5) i. p. 326.

A. niobe. A var. from Zermatt described and figured by Fallou, *ibid.* p. 103, pl. 1. figs. 1 & 2.

A. nevadensis, Edwards, figured in Butt. N. Amer. pt. viii. *Arg.* pl. 14.

A. aglaia: a var. described and figured, Ent. v. pp. 447, 448; another described by F. D. Wheeler, Ent. M. M. viii. p. 112; another (from Zermatt) described and figured by Fallou, *l. c.* p. 102, pl. 2. figs. 5 & 6.

A. euphrosyne: a var. described by F. E. Harman, Ent. v. pp. 395 & 396.

A. lathonia: a var. taken in La Vendée by Valette, noticed in Pet. Nouv. iii. p. 151.

Melitæa athalia. On its correct identification, see W. F. Kirby, Pr. E. Soc. 1871, p. xxi.

M. chalcædon, Doubl., figured with transformations by Edwards, Butt. N. Amer. pt. 7, *Mel.* pl. 1.

M. merope noticed by Frey, Mitth. schw. ent. Ges. iii. p. 408.

Grapta comma, Harr., and *G. dryas*, Edw., figured with transformations by Edwards, l. c. viii. *Gr.* pls. 2 & 3. *G. interrogationis*, Edwards (l. c. pt. 9, *Gr.* pls. 4 & 5) figures varr. *umbrosa* and *fabricii* in all stages. These are dimorphic forms; and he thinks that *G. comma* and *dryas* will also prove to be dimorphic forms of one species. Lintner maintains his former views on the identification of *G. interrogationis* in opposition to Edwards: Tr. Am. Ent. Soc. iii. pp. 197-204.

Grapta and *Argynnis*. Edwards, l. c., argues in favour of the distinctness of the described American species, both from one another and from European species.

Vanessa urticæ and *polychloros*. On their eggs, see J. Hellins, Ent. M. M. viii. pp. 52, 53.

V. caschmirensis, Koll., redescribed by Prittwitz, S. E. Z. xxxii. pp. 251, 252.

V. antiopa. A variety [apparently *V. lintneri*, Fitch] is described and figured, Ent. v. p. 423.

V. atalanta: an imago with a larval head is recorded, *ibid.* p. 233.

Dolischallia australis, Feld., probably = *Papilio polybete*, Cr., ♂. Prittwitz, l. c. p. 244.

Diadema octocula, Butl. The probable locality for this species is Totoya, Fiji Islands: it is hardly distinct from *D. formosa*, H.-S., which may be the ♂. [The latter name would then have priority.] Butler, Ann. N. H. (4) vii. p. 447.

Limenitis sibylla and *camilla*. On their synonymy, see W. F. Kirby, Pr. E. Soc. 1871, p. xlv.

L. disippus, Godt., redescribed and figured in all stages by Riley (Rep. Ins. Miss. iii. pp. 153-157), who (Canad. Ent. iii. pp. 52, 53, 117, 118) compares the structure of its larva with that of *L. ursula*.

Papilio acidalia, Web., = *Neptis aceris*, Lep.: W. F. Kirby, l. c.

Athyma kresna, Moore, = *Limenitis jadera*, D'Orb.: *id. ibid.*

Euryphene. Hewitson figures his *E. abesa*, Ex. Butt. 77, *Eur.* pl. 7. figs. 29 & 30; *E. elpinice*, 78, *Eur.* pl. 8. figs. 34 & 35, and *E. oxione*, figs. 36 & 37.

R[h]omaleosoma eupalus and *harpalyce* are distinct. Butler, Lep. Ex. i. p. 52.

Aterica lisandra, Stoll. Hewitson (Ex. Butt. pt. 78, *Eur.* pl. 8, and *Aterica*, f. 13 & 14) figures the ♀ (= *A. zeugma*, Hew.).

Apatura acca, Feld. ♀ described by Prittwitz, S. E. Z. xxxii. p. 244.

Papilio thersander, Don., is supposed by Westwood to be a false species: Pr. E. Soc. 1871, p. xli.

Puphia glycerium, Doubl., figured with transformations by Edwards, Butt. N. Amer. pt. 7, *Paph.* pl. 1; and by Riley, Rep. Ins. Miss. ii. pp. 125-128.

Nymphalis maris, Feld., = *Paphia stheno*, Prittw.; *N. pyrrhothea* and *N. titan*, Feld., probably = *rhyphea*, Cr.: Prittwitz, l. c. p. 245.

"*Eulaceira*" [? *Eulacura*], g. n., Butler, P. Z. S. 1871, p. 726. Allied to *Apatura*. Type *Ap. osteria*, Westw.

New species :—

- Colænis tithraustes*, Salvin, Ann. N. H. (4) vii. p. 405, Ecuador.
Atella manoro, Ward, Ent. M. M. viii. p. 121, Madagascar.
Argynnis vorax, Butler, Tr. E. Soc. 1871, p. 403, Shanghai; *A. bischoffi*, p. 189, Alaska, *helenæ*, p. 268, Colorado, Edwards, Tr. Am. Ent. Soc. iii.
Melitæa crithena, Salvin, l. c. p. 415, Chiriqui; *M. sterope*, Oregon, *thecla*, California, Edwards, l. c. pp. 190 & 191.
Eresia punctata, id. l. c. p. 191, Arizona.
Phyciodes orseis and *canace*, p. 206, California, *camillus* and *emissa*, pp. 268 & 269, Colorado: id. l. c.
Vanessa prorsoides, and var. *levanoides*, Blanchard, C. R. lxxii. p. 810, note 5, Thibet.
Eurema arcæi, Salvin, l. c. p. 415, Chiriqui.
Junonia rowara, Ward, Ent. M. M. viii. p. 82, Camaroons and Old Calabar.
Faunia dolores, Prittwitz, S. E. Z. xxxii. p. 244 [hab. — ?].
Godartia crossleyi and *trajanus*, Ward, l. c. p. 36, Camaroons.
Heterochroa makkeda, Para, *zalmona*, New Granada: Hewitson, Tr. E. Soc. 1871, p. 165.
Neptis pryeri, Butler, *ibid.* p. 403, Shanghai; *N. biafra*, Ward, l. c. p. 121, Camaroons.
Euryphene ribensis, Ribé, E. Africa, p. 35, *camarensis*, p. 35, *cercestis*, p. 36, *comus* and *nivaria*, p. 82, *porphyron*, p. 118, Camaroons, Ward, l. c.; *E. amicia*, figs. 27 & 28, and *carshena*, figs. 31 & 32, Old Calabar, *elabontas*, fig. 33, Creek Town, Hewitson (Ex. Butt. 77, *Eur.* pl. 7).
R[h]omaleosoma sarcoptera, p. 81, pl. 31. fig. 2, Gold Coast, *viridiotula*, p. 82, fig. 3, Gaboon, *vetusta*, *ibid.* fig. 5, W. Africa, Butler, Lep. Ex. i.; *R. janetta*, id. P. Z. S. 1871, p. 80, and l. c. p. 82, fig. 4, Fantee, Cape Coast.
Aterica felicia, id. P. Z. S. 1871, p. 80, and Lep. Ex. i. p. 73, pl. 28. fig. 3, and *zonara*, id. l. c. p. 81, and Lep. Ex. p. 72, figs. 1 & 2, Fantee.
Harma cyclades, *capella*, and *ciceronis*, p. 119, Camaroons, *cyriades*, p. 120, Camaroons and Cape-Coast Castle, Ward, Ent. M. M. viii.; *H. lurida*, Butler, l. c. p. 80, fig. 4, Fantee.
Charaxes hadrianus and *paphianus*, Ward, l. c. p. 120, Camaroons.
Paphia jansoni, Salvin, Ann. N. H. (4) vii. p. 165, Chontales.

Morphides.

BAR publishes notes on the *Morphides* and *Pavonides* of Guiana. Pet. Nouv. iii. p. 156.

Morpho eugenia, *adonis*, *hebe*, and *æga* are distinct species. Deyrolle, *ibid.* p. 125.

Morpho iphichus, Feld. Local form from Chanchomayo described by Prittwitz, S. E. Z. xxxii. p. 245. W. F. Kirby, Cat. D. Lep. p. 121, proposes the name *crameri* for *Papilio telemachus*, Cram., nec L., from Guiana, but afterwards (Pr. E. Soc. 1871, p. xlv) refers it to *M. iphichus*, Feld., = *P. ulysses*, Meerb., nec L.

Papilio cæruleus, Perry (Arcana, 1811), = *Morpho anaxibia*, Esp., var. (Brazilian type); *P. catenarius*, Perry (1811) = *M. epistrophis*, Hübn. (1816): Butler, Ent. M. M. viii. p. 167.

Æmona lena, sp. n., Atkinson, P. Z. S. 1871, p. 215, pl. 12. fig. 1, Yunan.

Brassolides.

Papilio demosthenes, Perry (Arcana, 1810), = *Caligo inachis*, Godt. (1823) : Butler, Ent. M. M. viii. p. 167.

Satyrides.

W. F. KIRBY, Cat. D. Lep., proposes the name *Bicyclus* for *Idiomorphus*, Doum., preoccupied in *Coleoptera*, type *I. hewitsoni*, Doum., p. 47; *blanchardi* for (*Epinephile*) *janirioides*, Blanch., nec H.-S., from Chili, p. 78; *hubneri* for (*Ypthima* *) *philomela*, Hübn., nec Linn., from India, p. 95.

Pierella draconis, Hübn., = *Papilio hyalinus*, Gmel.: W. F. Kirby, Pr. E. Soc. 1871, p. xlv.

Erebia nerine, Freyer, W. V.: var. *stelviana*, from Stelvia Alps, described by Curó, Bull. Ent. Ital. iii. pp. 347-349.

Epinephile janira. ♂ aberration described by Krause, S. E. Z. xxxii. p. 135.

Mycalesis ignobilis, Butl., figured: Butler, Lep. Ex. i. pl. 21. fig. 4.

Cænonympha satyrion, Esp. On its variation see Butler & Müller, Pr. E. Soc. 1871, pp. vii, x.

Pronophila. Hewitson (Ex. Butt. 78, *Pron.* pl. 5) figures his *P. praxithea*, figs. 28 & 29, *alusana*, figs. 30 & 31, *pelinna*, figs. 32 & 33, and *phædra*, figs. 34 & 35.

New genera and species:—

Palæonympha, Butler, Tr. E. Soc. 1871, p. 401. Allied to *Neonympha*. Type *P. opalina*, sp. n., *id. l. c.*, Shanghai.

Periplysia, Gerstäcker, Arch. f. Nat. xxxvii. p. 358. Allied to *Ypthima*. Type *P. leda*, sp. n., *id. l. c.*, Zanzibar.

Zophoessa andersoni, Atkinson, P. Z. S. 1871, p. 215, pl. 12. fig. 3, Yunnan.

Lethe satyrina, Butler, Tr. E. S. 1871, p. 402, Shanghai; *L. alberta*, *id.* Ann. N. H. (4) viii. p. 283, Benares.

Euptychia languida, Bogota, *cyanites*, Brazil, Butler, Ann. N. H. (4) viii. p. 282; *E. rubricata*, Edwards, Tr. Am. Ent. Soc. iii. p. 212, Texas.

Erebia passandava, Ward, Ent. M. M. viii. p. 122, Madagascar; *E. rhodia* and *callias*, Edwards, *l. c.* pp. 273 & 274, Colorado.

Satyrus gabbi, Edwards, *l. c.* p. 193, Oregon.

Chionobas stretchii, Edwards, *l. c.* p. 192, Nevada.

Mycalesis anganavo, Ward, Ent. M. M. viii. p. 122, Madagascar.

Cænonympha ampelus, Edwards, *l. c.* p. 213, Oregon.

Ypthima * *zodia*, Butler, Tr. E. Soc. 1871, p. 402, Shanghai.

Oxeoschistus cothion, Salvin, Ann. N. H. (4) vii. p. 413, Veragua, Chiriqui.

Pronophila timanthes, *id. l. c.* p. 412, Veragua, Chiriqui.

Eurytelides.

Elymnias. Butler (P. Z. S. 1871, pp. 518-525) divides the species between *Elymnias*, Hübn., and *Dyctis*, Boisdu. A list of species is given, 4 being described as new, viz. *Elymnias nigrescens*, Sarawak, *hecate*, Labuan, *fraterna*, Ceylon, *caudata*, Canara, p. 520, pl. 42. figs. 1-4.

* [*Rectius* *Ipthima* (Hübn., 1816), Dejean's subsequent *Ipthimus* in the *Tenebrionidæ* requiring to be renamed.—E. C. R.]

Erycinides.

W. F. KIRBY, Cat. D. Lep., proposes the names *Lemoniidae* and *Lemoniinae* [? *Lemoniadiidae* and *Lemoniadinæ*] for the groups usually known as *Erycinidae* and *Erycininae*, *Erycina* being preoccupied in Conchology, pp. 282 & 299; *Euselasiinae* for *Eurygoninae*, Bates, *Eurygona* being now a synonym, p. 294; *Aculhua* for *Dryas*, Feld., preoccupied in *Lepidoptera*, type *Limnas cinaron*, Feld., p. 301; *Rusalkia* for *Oreas*, Feld., preoccupied in *Lepidoptera*, &c., type *O. marathou*, Feld., p. 306; *Nahida* for *Threnodes*, Hew., preoccupied in *Lepidoptera*, type *T. canoides*, Hew., p. 651; *Cartea* for *Orestias*, Feld., *Orestia*, Bates, preoccupied in *Pisces* and *Coleoptera*, type *Limnas vitula*, Hew., p. 308.

Mesosemia. Butler (Lep. Ex. i. pl. 32) figures his *M. jeziela*, fig. 1, *issia*, figs. 3 & 4, *thymetina*, figs. 5 & 6. Hewitson (Ex. Butt. 79, *Mes.* pl. 11) figures his *M. mycene*, figs. 101 & 102, *mamilia*, figs. 103 & 104, *zaoa*, figs. 105 & 106, *mustela*, figs. 107 & 108, *ahava*, figs. 109 & 110, *mancia*, fig. 111.

Chamelimnas and *Ithomiola* (= *Compsotera*, Hew., olim). Hewitson (Ex. Butt. 80) figures *C. briola*, Bates, figs. 1 & 2, and his own *C. phœnias*, figs. 3 & 4, and *villugomes*, fig. 6, and *I. celtilla*, fig. 4, and *callixena*, fig. 5.

Symmachia. Hewitson (Ex. Butt. 79, *Symmachia* and *Charis*, pl. 2) figures his *S. cleonyma*, figs. 12 & 13, *leena*, figs. 14 & 15, *titiana*, fig. 16, *temesa*, figs. 17 & 18, *threissa*, fig. 19.

Nymphidium. Hewitson (*ibid.*, *Nymph.* pl. 4) figures *N. ethelinda*, figs. 25 & 26, *onæum*, figs. 27 & 28, *phillone*, Godt., figs. 29 & 30, *phliasus*, Cl. & Cr., fig. 31.

New species:—

Mesosemia veneris, Butler, Lep. Ex. i. pl. 32. fig. 2, Minas Geraes.

Eurygona argentea, Hewitson, Tr. E. Soc. 1871, p. 166, Chontales, Nicaragua.

Lepricornis atricolor, Butler, Ann. N. H. (4) viii. p. 284, Brazil.

Chamelimnas cercides, Hewitson, Ex. Butt. 80, *Cham.* and *Ithomiola*, fig. 5 [hab. —?].

Emesis clearista (Doubl. MS.), Butler, Ann. N. H. (4) viii. p. 283, Honduras.

Charis calagatis, Hewitson, Ex. Butt. 79, *Symmachia* and *Charis*, pl. 2. figs. 11 & 12 [hab. —?], *caciparis*, *id. l. c.* figs. 13 & 14, New Granada (? = *Crocozona pheretima*, Feld.); *C. nemesis*, Edwards, Tr. Am. Ent. Soc. iii. p. 212, Arizona.

Lemonias palmeri, Edwards, *l. c.* p. 195, Utah.

Nymphidium nealces, Hewitson, Ex. Butt. 79, *Nymph.* pl. 4. figs. 32 & 33, Cayenne.

Lycænides.

W. F. KIRBY, Cat. D. Lep., proposes the name *Hewitsonia* for *Corydon*, Hew., preoccupied in *Aves*, type *C. boisduvali*, Hew., p. 426; *alcibiades* for (*Iolaus*) *timon*, Don., nec F., p. 409; *hewitsoni* for (*Thecla*) *ira*, Hew., nec Godt. (*irus*), from Mexico, p. 386; *wilhelmina* for (*T.*) *sphinx*, Godt., nec F., S. America, p. 391; *lydia* for (*T.*) *timæa*, Hew., nec Feld. (*timæus*), Para,

p. 393; *donovani* for (*Cupido*) *hylax*, Don., nec F., p. 346; *morgiana* for (*C.*) *hyrcana*, Led., nec Feld., Persia, p. 369; *amazara* for (*C.*) *hypoleuca*, Prittw., nec Koll., Australia, p. 376; *sibylla* for (*C.*) *endymion*, Blanch., nec W. V., Chili, p. 377.

A[r]hopala phryxus, *danis*, *spurius*, *paupera*, *taygetus*, *punctata*, and *heliodes*; for notes on these spp. cf. Prittwitz, S. E. Z. xxxii. pp. 343 & 344.

Thecla rubi. Eggs and young larvæ described by Hellins, Ent. M. M. vii. p. 232.

T. dolichus, Hübn., redescribed by Grote, Canad. Ent. iii. p. 102.

Lycæna. On a singular organ in the larva, see Goossens, Ann. Soc. Ent. Fr. (5) i. Bull. pp. lxxvii & lxxviii.

Millière (Ann. Soc. L. Lyon, xviii. pl. 108) describes and figures (mostly with transformations) *L. telicanus*, p. 68, figs. 10-13; *L. melanops*, p. 70, figs. 1-4; *L. cyllarus*, var. (?), p. 73, figs. 5, 6; *L. argiolus*, p. 73, figs. 7-9.

L. alsus. Transformations described by J. Hellins, l. c. pp. 186 & 187.

L. argiolus. "Life-history" to second moult described by Newman, Ent. v. pp. 337-339.

L. echo, Edw., = *piasus*, Boisd.: Edwards, Synopsis Butt. N. Amer. p. 37.

L. dryope, Edw. Both sexes described, *id.* Tr. Am. Ent. Soc. iii. p. 193.

L. lycea, Edw. ♀ described, *id.* l. c. p. 273.

Polommatus artaxerxes is attracted by blue flowers. Scot. Nat. i. p. 43.

New species :—

Thecla cygnus, p. 207, Nevada, *castalis* (= *damon*, Cr.), pp. 208 & 216, *autolycus* and *alcestis*, p. 271, Texas, *ninus*, p. 210, Colorado, Edwards, Tr. Am. Ent. Soc. iii.; *T. betuloides* [*? rectius betulæformis*] (Lucas, MS.), p. 810, note 6, and *saphir*, p. 811, note 1, Thibet, Blanchard, C. R. lxxii.

Chrysophanus ianthe, Nevada, *sirius*, Colorado: Edwards, Tr. Am. Ent. Soc. iii. pp. 211 & 270.

Lycæna mintha, p. 194, *ardea*, p. 209, *glaucon*, p. 210, Nevada, *fulla* and *helius*, pp. 194 & 208, California, *viata*, p. 209, Sierra Nevada, *gyas*, p. 210, Arizona, *fea*, p. 211, Texas, *daunia* and *alce*, p. 272, Colorado, *id.* l. c.; *L. kersteni*, Gerstäcker, Arch. f. Nat. xxxvii. p. 359, Zanzibar.

Hesperiïdes.

W. F. KIRBY, Cat. D. Lep., proposes the name *Casyapa* for *Chatocneme**, Feld., preoccupied in *Coleoptera*, type *C. corvus*, Feld., p. 576; *Butleria* for *Thracides*, H.-S., nec Hübn., = *Carterocephalus*, Butl., nec Led., type *C. exornatus*, Feld., p. 624; *meriani* for (*Telegonus*) *bixæ*, Westw., nec L., from Surinam, p. 574; *schelleri* for (*Pamphila*) *pertinax*, Sepp, nec Cr., Surinam, p. 606; *fabricii* for (*Pythonides*) *jovianus*, F., nec Cr., Brazil, p. 627.

Butler (Ent. M. M. vii. p. 265) replies to Herrich-Schäffer's strictures on his synopsis of the genera. The latter author publishes a rejoinder, with notes on some of the genera of *Hesperiïdæ*, in CB. Ver. Regensb. xxv. pp. 103 & 104.

Butler (Lep. Ex. i. pl. 25) figures his *Goniurus lindora*, *corydon*, *hirtius*, *jethira*, and *cenis*, *Eudamus epigena*, *Æthilla memmius*, and *Æ. coracina*, figs. 1-8; *Telegonus cepio*, figs. 9 & 10; *T. egregius* and *T. lotus*, figs. 11 & 12.

* [*Chatocnema*, Steph., is only a syn. of *Plectroscelis*.—E. C. R.]

Pyrrhopyga. Hewitson (Ex. Butt. 80) figures his *P. ahira*, *zonara*, *Pyrr.* pl. 2. f. 9, 10, *zereda* (nec *hygia*, Feld.), f. 13, *spatiosa*, f. 15, *arathyrea*, *aziza*, *gazera*, *gortyna*, *pedaia*, and *hadora*, pl. 3. figs. 18–23.

Gonioba vulpecula, Prittw., = *Netrocoryne repanda*, Feld.: Prittwitz, S. E. Z. xxxii. p. 345.

Hesperia conspicua, Edw. ♂ described by H. W. Parker, *Canad. Ent.* iii. p. 51.

Nisoniades. On the species found in the northern United States, cf. *id. l. c.* pp. 112 & 113.

Ægiale kollari, Feld., is described and figured by D. J. Blasquez (*Nat. Mex.* pt. 14, pp. 282–284, pl. 5. f. 1–5) under the name of *Teria agavis*, as = *Terias agave*, Fab. & Boisd. See also Boisdual, *Pet. Nouv.* iii. p. 163.

Pardalodes, g. n., Herrich-Schäffer, *CB. Ver. Regensb.* xxv. p. 103. Allied to *Cyclopides*. Type *Papilio edipus*, Cr.

New species ;—

Telegonus omphale, Butler, *Ann. N. H.* (4) viii. p. 284, Ega, Venezuela.

Ismene anchises, Gerstäcker, *Arch. f. Nat.* xxxvii. p. 359, Zanzibar.

Pyrrhopyga crida, Chontales, Nicaragua, and *P. eximia*, Venezuela, Hewitson, *Tr. E. Soc.* 1871, p. 167; Ex. Butt. 80, *Pyrr.* pl. 2. figs. 14 & 12; *P. zimra*, *id. l. c.* fig. 11 [hab. —?], *amra*, *id. l. c.* pl. 3. figs. 16 & 17, Mexico.

Hesperia minima, p. 196, *tamenund*, p. 215, *eos*, p. 276, *horus*, p. 277, Texas; *ophis*, p. 216, Florida, *dacotah*, p. 277, Colorado: Edwards, *Tr. Am. Ent. Soc.* iii.

Pamphila draco, p. 274, Colorado, *licinus* and *attalus*, pp. 275 & 276, Texas; Edwards, *l. c.*

Thymelicus hylar, *id. l. c.* p. 274, Colorado.

Cyclopides (and *Stereoptes*) *skada*, *id. l. c.* pp. 196 & 214, Kodiak.

Heteropterus arene, p. 214, Arizona, *procris*, p. 215, Texas: *id. l. c.*

Plesioneura liliana, Atkinson, *P. Z. S.* 1871, p. 216, pl. 12. fig. 2, Yunnan.

Syrichthus * *petræus*, p. 195, Nevada, *oceanus*, p. 213, Arizona: Edwards, *l. c.*

SPHINGIDÆ.

Chærocampa pampinatrix, *Philampelus achemon* and *satellitæ* (of which *lycaon*, Cr., is a var.), and *Thyreus abboti*, injurious to the vine in N. America, are described and figured in all stages by Riley, *Rep. Ins. Miss.* ii. pp. 71–79. The transformations of *C. pampinatrix* are also described and figured by Saunders, *Canad. Ent.* iii. pp. 66–68.

Sphinx ligustri. On its parthenogenesis, see S. Clegg, *Ent.* v. pp. 356, 357.

S. drupiferarum, Sm. Abb. Transformations figured and described by E. B. Reed, *Canad. Ent.* iii. pp. 4–7.

Deilephila esulæ. Stefanelli's remarks on this supposed fictitious species are translated, *Ann. Ent. Belg.* xiv. c.-r. pp. 22 & 23.

D. tithymali, Chavign., nec Boisd., = *euphorbiæ*, Luc., nec L., from Mauritania and Andalusia, is renamed *mauritanica*: Staudinger, *Cat. Lep. Eur.* p. 36.

D. galii. Young larvæ described by W. D. Robinson, *Ent. M. M.* vii. pp. 187, 188.

D. lineata. Described and figured, with 2 varr. of larvæ, by Riley, *l. c.* iii. pp. 140–142.

* [Boisd., 1840; *Syrichthus*, Hope, 1837, *Dynastidæ*.—E. C. R.]

D. elpenor. Kuwert has discovered an air-bladder in its abdomen, which he supposes to exist also in other *Lepidoptera*, and to be employed to inflate the nervures of the wings on the insect emerging from the pupa. S. E. Z. xxxii. pp. 306-308.

Chærocampa elpenor. An extraordinary var., with hyaline centre to wings, is mentioned by Knaggs, Ent. Ann. 1872, pp. 110 & 111; Bond, Pr. E. Soc. 1871, p. xxxiv [cf. the description of *Sphinx bombyliiformis*, L.].

C. erotus, Cr. Koch thinks two species may be confounded under this name: S. E. Z. xxxii. pp. 239-241.

Smerinthus. On hybrids between *S. ocellatus* ♂ and *populi* ♀, see E. Birchall, Rep. Br. Ass. 1870, pp. 111, 112.

On synonymy of *Sesia bombyliiformis* and *fuciformis*, and of various foreign *Sphingidæ*, see W. F. Kirby, Pr. E. Soc. 1871, pp. xxi, xxvii-xxix, xliii, & xlix.

Macroglossa hirundo, sp. n., Gerstäcker, Arch. f. Nat. xxxvii. p. 360, Zanzibar.

Aellopus blaini, sp. n., Grote, Tr. Am. Ent. Soc. iii. p. 184, Cuba.

Deilephila spinifascia, sp. n., Butler, P. Z. S. 1871, p. 81, Buenos Ayres.

Sphinx diffissa, sp. n., Butler, l. c. p. 82, Buenos Ayres.

STYGIIDÆ.

Stygia ledereri, sp. n., Staudinger, l. c. p. 61, Taurus.

ÆGERIIDÆ.

Ægeria polistiformis, Harr. Figured and transformations described by Riley, Rep. Ins. Miss. iii. pp. 75-77.

Æ. exilis. Larva figured, with description of transformations, by W. Saunders, Canad. Ent. iii. pp. 22, 23.

Sesia. Millière (Ann. Soc. L. Lyon, n. s., xviii.) figures and notices *S. monspeliensis*, p. 23, pl. 103. figs. 4 & 5; *himmighoffeni* and *agdistiformis*, p. 24, pl. 104. figs. 6 & 7.

URANIIDÆ.

Urania rhipheus. On this species, and its alleged occurrence in Asia, see Trimen, P. L. S. xi. p. 284.

Urania leilus. On its migrations, see Nature, iv. pp. 12, 13, 494.

Thaliura cræsus, sp. n., Gerstäcker, Arch. f. Nat. xxxvii. p. 361, Zanzibar.

CASTNIIDÆ.

Alypia octomaculata. Habits and transformations described, and larva and imago figured, by Riley, Rep. Ins. Miss. ii. pp. 80-82.

ZYGÆNIDÆ.

Procris statice with abnormal antennæ (Selys-Longchamps): specimens temporarily of a coppery-bronze colour (Fologne): Ann. Ent. Belg. xiv. c.-r. pp. 42, 47.

P. (Acoloithus) americana. Described and figured in all stages by Riley, l. c. pp. 85-87.

Zygæna. Millière (Ann. Soc. L. Lyon, n. s., xviii. pl. 107) figures and describes in all stages *Z. stachadis*, p. 60, figs. 1-6; *erythrus*, p. 65, figs. 9-11; and the larvæ of *fausta*, p. 63, figs. 7 & 8, and *nimos*, p. 66, fig. 12.

Z. filipendulæ, *loniceræ*, and *trifolii* have been critically examined in all their stages by T. H. Briggs, who considers that two perfectly distinct species have been confounded by British Lepidopterists under the name of *Z. trifolii*. He does not, however, assign a name to the supposed new species. Tr. E. Soc. 1871, pp. 417-440.

Z. filipendulæ was captured as late as the middle of October at Malvern, Lincolnshire: Ent. v. p. 443. The red colouring on its wings is changed to yellow by the application of muriatic acid, probably from the presence of copper, while the red colouring of *Vanessa atalanta* is unaltered: S. Piesse, Nature, iii. p. 127.

Z. exulans, Hoch. Specimens intermediate between the type and the Scandinavian var. *vanadis*, Dalm., have occurred in Perthshire. Ent. M. M. viii. p. 68; Ent. Ann. 1872, pp. 112 & 113, fig. 6.

Glaucopsis lethe, F., = *Eumolphus*, Cr.; var. *sperchius*, Cr., = *lethe*, Gmel., Hübn., Walk., = *formosa*, Guér., Boisd., Walk., Wallengr., = *folleti*, Guér., Boisd. [also = *inconstans*, Walk.]. Prittwitz, S. E. Z. xxxii. pp. 237 & 238.

Ctenuchidia, g. n., Grote, Proc. Ent. Soc. Phil. v. p. 227, note. Type *Ctenucha virgo*, H.-S.

Syntomis andersoni, p. 244, fig. 1, *sladeni*, fig. 5, *grotii*, fig. 4, and *atkinsoni*, fig. 2, p. 245, *fitchii*, p. 246, fig. 3, Moore, P. Z. S. 1871, pl. 18, Yunan: spp. nn.

NYCTEOLIDÆ.

Halius prasinana and *quercana*. On the sound which these spp. are stated to produce, see A. H. Swinton and F. O. Morris, Ent. M. M. vii. p. 231, viii. pp. 70 & 71, 138 & 139.

Earias vernana occurs in N. Germany, where it was formerly confounded with *chlorana*. Transformations described by Zeller, S. E. Z. xxxii. pp. 53 & 54.

LITHOSIIDÆ.

Psychomorpha epimenis, Dru. Transformations described and figured by Riley, Rep. Ins. Miss. iii. pp. 63-65.

Phægorista similis, Walk. ♂ described by Butler, P. Z. S. 1871, p. 83.

Gnophria vittata, Harr. Larva described by W. Saunders, Canad. Ent. iii. p. 36.

Asymbata, g. n., Gerstæcker, Arch. f. Nat. xxxvii. p. 360. Allied to *Aganais*. Type *A. roseiventris*, sp. n., *id. l. c.*, Zanzibar.

New species:—

Esthema herrona, Bogota, *euplæodes*, Columbia, *uraniides*, Cayenne: Butler, Ann. N. H. (4) viii. p. 285.

Hyalurga uria, *id. l. c.* p. 286, Ucayale.

Pericopsis rosina, *id.* P. Z. S. 1871, p. 82, Lep. Ex. pl. 30. f. 1, Ega; *hydra*, Ecuador; *ithrana*, Amazons, p. 286, *kenara*, Sta. Marta, *fulgorata*, Para, *hazara*, Villa Nova, Ecuador, p. 287, *formosissima*, Columbia, Ecuador, *lunifera*, Bahia, p. 288, *thyridina*, Ecuador, *vestalis*, Brazil, *holofermes*, Minas Geraes?, p. 289: *id.* Ann. N. H. (4) viii.

Phaloesia olympia, *id. l. c.* p. 290, Brazil.

Eucyane hystaspes, *id.* P. Z. S. 1871, p. 82, Venezuela.

Nyct[h]emera hymenæa, Gerstäcker, Arch. f. Nat. xxxvii. p. 360, Zanzibar.
Lithosia cephalina, Grote & Rob. Tr. Am. Ent. Soc. iii. p. 176, Texas.

ARCTIIDÆ.

Callimorpha hera has occurred at Exeter: H. d'Orville, Ent. M. M. viii. p. 87, Ent. Ann. 1872, p. 114.

C. fulvicosta, Clem. (of which *vestalis*, Pack., is a var.). Transformations figured and described by Riley, Rep. Ins. Miss. iii. pp. 132-134.

Alaria florida. Transformations described by W. Saunders, Canad. Ent. iii. p. 76.

Arctia mendica. A var. described by W. H. Hamilton, Ent. v. pp. 314 & 315.

A. sordida. On a ♂ coupling with 2 ♀s, see Fallou, Ann. Soc. Ent. Fr. (5) i. p. 21.

Chelonia villica. Larva will eat blackthorn: R. Meldola, Ent. v. pp. 319 & 320.

C. quenseli. Fallou, l. c. p. 110, pl. 2. f. 4, remarks on and figures the larva.

Spilosoma virginicum, Fabr., and *Hyphantria textor*, Harr. Transformations described and figured by Riley, l. c. iii. pp. 68 & 69, 130-132.

Hyphantria cunea, Drury. Larva (very injurious to apple-trees) described by W. Saunders, Canad. Ent. iii. pp. 36, 69, 70.

Epantheria gulo and *mæsta* (Moritz, MS.), Walk. (1862), were published by Herrich-Schäffer as species of *Lichnoptera* (ante 1858): Prittwitz, S. E. Z. xxxii. p. 237.

Halesidota maculata, Harr. Larva described by W. Saunders, Canad. Ent. iii. p. 186.

Vanessodes, g. n., Grote & Robinson, Tr. Am. Ent. Soc. iii. p. 176. Allied to *Euchaetes*. Type *V. clarus*, sp. n., *id. ibid.*, Texas.

Pygaretia, g. n., Grote, Canad. Ent. iii. p. 124. Type *P. abdominalis*, sp. n., *id.*, Alabama, and *leucophaea*, Smith, redescribed, *ibid.*

Arctia williamsi, sp. n., Dodge, Canad. Ent. iii. p. 167 and fig., Colorado.

Nelphe coccineipes, sp. n., Grote, Tr. Am. Ent. Soc. iii. p. 187, Cuba.

LIPARIDÆ.

Orgyia cœnosa. On its parthenogenesis, see T. Brown, Ent. v. p. 395.

O. leucostigma. Larva figured, and eggs described, by W. Saunders, Canad. Ent. iii. pp. 14 & 15.

Liparis dispar. On rearing this species from hawthorn and elm, see T. H. Briggs, Pr. E. Soc. 1871, p. ix.

Jana rosacea, sp. n., Butler, Lep. Ex. pl. 30. f. 3, Fantee, Cape Coast; *J. rhodoptera*, Gerstäcker, Arch. f. Nat. xxxvii. p. 361, Zanzibar.

PSYCHIDÆ.

Millière, Ann. Soc. L. Lyon, n. s. xviii. pl. 102, figures, with transformations, *Typhonia phryganilugubrella* (?), Br., p. 7, f. 1-3; *Psyche cinerella*, Dup., p. 12, f. 5-12; and *P. millierella*, Boisd., p. 18, f. 13-16. He remarks on the synonymy of several other species, and figures details of *P. albida*, Tr., and *febretta*, Fonsc., f. 17-19.

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Thyridopteryx ephemeriformis. Clemens's notes on this species, Proc. Ent. Soc. Phil. vi. pp. 221 & 222, have escaped notice in former vols. of Zool. Rec.

Æceticus kirbii. Zeller describes the cocoon &c. as *Psyche gigantea*, S. E. Z. xxxii. pp. 49-52, 80 & 81, pl. 2.

Psyche hirsutella, S. V., O., nec Hübn., from the Austrian Alps, is named *schiffermulleri*: Staudinger, Cat. Lep. Eur. p. 64.

Cochlophora, g. n., von Siebold, Beitr. z. Parthen. d. Arthropoden, p. 136. Type *Psyche helix* (to which chap. 4 is devoted, pp. 131-144); also, but with a query, *C. valvata*, sp. n., Gerstäcker, Arch. f. Nat. xxxvii. p. 361, Zanzibar.

Psyche viadrina, sp. n., Staudinger, Cat. Lep. Eur. p. 62; Wocke, S. E. Z. xxxii. p. 426. *P. abencerragella*, Millière, l. c. p. 11, pl. 102. figs. 4 & 5, Granada.

NOTODONTIDÆ.

Asteroscopus, *Diloba*, and *Demas*. Judging from the shape of the eggs &c., these genera should be transferred to the *Noctuæ*: F. B. White, Ent. M. M. vii. pp. 230 & 231.

Datana. Grote & Robinson remark on the described species, Proc. Ent. Soc. Phil. iv. pp. 490 & 493.

Ptilophora plumigera. Life-history by Buckler, Ent. M. M. vii. pp. 210-212.

Traumatocampa, g. n., Wallengren, Scand. Het. ii. 2, p. 158. Type *Gastropacha* (*Cnethocampa*) *pinivora*, Tr.

Datana perspicua, sp. n., Grote & Robinson, l. c. p. 489, pl. 3. fig. 1, Chicago, Illinois.

DREPANULIDÆ.

Platypteryx. Notes by G. H. Raynor, Ent. v. pp. 455 & 456.

SATURNIIDÆ.

A list of the *Saturniide* in Musée Royal d'Hist. Nat. de Belgique is given by De Borre, Ann. Ent. Belg. xiv. pp. 27-29.

Saturnia cynthia. Wulschlegel regards the forms figured by D'Aubenton and Drury as two distinct species. He describes the larvæ of both, and remarks on hybrids: S. E. Z. xxxii. pp. 404-406; Mitth. schw. ent. Ges. iii. pp. 327-330.

S. isabellæ, Graëlls, figured and described in all stages by Millière, Ann. Soc. L. Lyon, n. s., xviii. p. 1, pl. 101.

S. rhodoessa, Prittw., = *Polythysana rubescens*, Blanch. & Walk.: Prittwitz, S. E. Z. xxxii. p. 253.

S. yamamai. On rearing at Munster, in Westphalia, see H. Landois, Verh. Ver. Rheinf. xxviii. SB. pp. 59 & 60. Verson (SB. Ak. Wien, lxi. pp. 913-929, 3 pls.), discussing the anatomy of this species, principally treats of the digestive organs of the larva and embryo.

Bombyx perni. On its cultivation in China, see Pr. E. Soc. 1871, pp. xxv-xxvii.

Brahmæ swanzii, Butler, is figured, Lep. Ex. i. pl. 30. fig. 2.

Samia, Hübn. Grote (Proc. Ent. Soc. Phil. v. pp. 228 & 229) considers Hübn. 3 species to be the types of 3 genera:—*Samia*, type *cynthia*, Dr.;

Platysamia, Grote, type *cecropia*, L.; and *Callisamia*, Pack., type *promethea*, Dr. The two former genera are described (p. 228) [but the names, as used by Grote, cannot stand, because *cecropia* has been selected as the type of *Samia* by Walker and Packard. Duncan figures *cecropia* and *promethea* under the generic name of *Hyalophora*, but his type appears to be *Attacus atlas*. Duncan, Ex. Moths, p. 124, pls. 11 & 12].

Attacus cecropia. On the nomenclature of this and other N.-American species of the group, see W. Couper, Canad. Ent. iii. pp. 61 & 62; and for a full history, and figures of all stages, W. Saunders, *ibid.* pp. 149–155.

Samia columbia, Smith, described and figured by V. T. Chambers, *ibid.* pp. 201–204.

Attacus luna. Larva attacked by *Tachina*, and yet imago reared: *ibid.* pp. 43 & 44.

Telea polyphemus, Cr., = *Attacus paphia*, L.: W. F. Kirby, Pr. E. Soc. 1871 p. xliv.

Hyperchiria incisa, Walk., = *Phalena cypria*, Gmel.; *H. (Attacus) io*, Cr., nec F., from Surinam, is renamed *vala*: *id.* l. c. p. 43.

Citheronia regalis, F., and *sepulchralis*, Gr. & Rob. On their larvæ, see Grote & Robinson, Proc. Ent. Soc. Phil. iv. p. 490.

Attacus amazonia, sp. n., Packard, Rep. Peab. Ac. 2 & 3, p. 85, Pebas, Ecuador.

Platysamia californica, sp. n., Grote, Proc. Ent. Soc. Phil. v. p. 229, California.

Dirphia venata, Buenos Ayres, *D. lancea* (= *Heliconisa impar*, ♀, Walk.), utler, P. Z. S. 1871, p. 83: spp. nn.

BOMBYCIDÆ.

Trichiura cratægi. On the forms of the larva, see Briggs, Pr. E. Soc. 1871, p. ix.

Bombyx franconica. On the larva, see Fallou, Ann. Soc. Ent. Fr. (5) i. pp. 108 & 109.

Clisiocampa sylvatica and *americana*. Transformations described and figured by Riley, Rep. Ins. Miss. ii. pp. 37, 117–129.

Eriogaster lanestris. Two larvæ frequently spin up in one cocoon: A. C. Hervey, Ent. v. p. 459.

Bombyx quercus. On its "assembling," see J. R. S. Clifford; its larva will eat ivy, according to M. A. J. Pitman, Ent. v. pp. 441, 442, 457.

B. callunæ is not truly distinct from *quercus*. A female of the former will "assemble" males of the latter: Wonfor, M. Micr. J. vi. pp. 251 & 252.

Lasiocampa trifolii and *Clisiocampa castrensis*. Varr. recorded by Bond, Pr. E. Soc. 1871, p. xxxix.

Gastropacha pini. On its parthenogenesis, see Kefenstein, S. E. Z. xxxii. p. 326. It is very destructive in German forests: Ratzeburg, SB. Nat. Fr. 1870, pp. 72 & 73.

G. arbusculæ, Freyer. On this and its allies, see J. A. Curó, Bull. Ent. Ital. iii. pp. 349–351.

Sericiculture.

Bombyx mori. On its parthenogenesis in Italy, see von Siebold, Bull.

Ent. Ital. iii. pp. 411–413; Beitr. z. Parth. der Arthropoden, pp. 230–235. On the artificial hatching of its eggs, see E. Duclaux, C. R. lxxiii. p. 917.

On variation in Silkworms, see Darwin, 'Variation of Animals and Plants under Domestication,' i. pp. 300–304.

GIRARD, Ann. Soc. Ent. Fr. (5) i. pp. 361–368, remarks on sericulture in the Bois de Boulogne in 1870. *Sericaria mori* was much diseased; *Attacus yamamai* did not produce a single cocoon; *A. cynthia* is so far acclimatized as to be likely to become valuable, and should be inserted in the French lists with *Chariclea delphinii* and other species now well established in France.

GUÉRIN MÉNEVILLE remarks editorially on the papers on sericulture communicated to the Académie des Sciences in 1870: R. Z. (2) xxii. pp. 234 & 235, 287 & 288, 313–315.

Notes on sericulture, Bull. Ent. Ital. iii. pp. 111 & 112, 215 & 216.

On Reichenbach's analysis of diseased Silkworms, see Sobrero, Atti Acc. Tor. vi. pp. 435–439.

On the presence of uric acid in the skin of the Silkworm, see G. P. Vlaco-vich, Atti Ist. Venet. (4) i. pp. 2275–2284.

On muscardine and pebrine, see Huxley, Rep. Br. Ass. 1870, pp. lxxxvi–lxxxix.

BELLOTTI publishes observations on pebrine made during the season of 1870, Atti Soc. Ital. iii. pp. 207–223.

ZEUZERIDÆ.

Cossus ligniperda sometimes spins up underground: G. Norman, Ent. M. M. viii. p. 70.

On rearing *C. ligniperda* and *Zeuzera æsculi*, see J. Russell, Ent. v. pp. 456 & 457.

Zeuzera (Eudoxyia) xylotribus, H.-S. Packard describes a ♂ from Pebas, Rep. Peab. Ac. ii. & iii. p. 86.

NOCTUIDÆ.

STAUDINGER, Cat. Lep. Eur., proposes the names *Thaumasta* (type *expressa*, Led., p. 79) and *Oxytripia* (type *orbiculosa*, Esp., p. 98) for two uncharacterized genera; *candelarum* for (*Agrotis*) *candelisequa*, auct., nec Hübn. (Vög. u. Schmett.), from Europe, p. 82; *imperialis* for (*Heliothis*) *purpurascens*, Led., nec Tausch., p. 129.

ERSCHOFF (Bull. Mosc. xliii. pp. 307–315) publishes the following notes on the *Noctuidæ* described by Eversmann:—*Caradrina albuncula* and *squalida*, *Xylina scripturosa*, and *Hadena acuminifera* are to be referred to *Agrotis*, *A. forficula* and ? *lutescens* to *Dianthæcia*, *A. khirghisa* and *Hadena abrupta* to *Crymodes*, *H. subcontigua* and *furca* to *Mamestra*, *H. multicuspis* to *Aporophila*, *H. felina* to *Bryophila*, *Cosmia vulpecula* to *Leucania*, *Mamestra sylvicola* to *Hadena*, *Leucania stigmatica* and *Caradrina distracta* to *Nonagria*, *Ophiusa sesquistria* to *Leucanites*, and *Hermينيا rectalis* to *Simplicia*, Guén.; *Agrotis repanda* (nec Frey.) and ? *detorta* = *tritici*, varr., *A. rustica* = *nigricans*, *A. robusta* = *trifurca*, var., *A. bombycina* = *Mamestra leucophaea*, S. V.; *Caradrina cohesa* = *A. xanthographa*, S. V., *C. grisea* and *congesta* (and *menetriesi*, Kretsch., and *cinerascens*, Tengstr.) ? = *cubicularis*, varr., *C. distensa* = *lætabilis*, Zett.; *Hadena actinobola* = ? *Mamestra dianthi*, *H. bombycia* = ? *Agrotis fatidica*, Hübn., *H. bidens* = *leucodon*; *Orthosia murina* = *Agrotis cinerea*, S. V.;

Polia obvia = ? *Hadena dentina*; *Xanthia subflava* = *citrago*, var., *X. veterina* = *Hadena* (ead.), Led., *X. vulpina* = *vulpecula*, Led., *X. senica* = ? *Acronycta literata*, Brem.; *Cucullia consors* = *campanulæ*, Frey.; *Plusia renardi* = that of H.-S. & Led.; *Anthophila argillacea* = *Thalpochares polygramma*, Dup.; *Euclydia cuspidata* (nec Hübner) = ? *glyphica*, var.; and *Agrotis ruta*, *armena*, *deserticola* and *fallax*, and *Plusia uvalensis* are respectively good species.

BERCE, in the 2nd (and concluding) part of vol. iv. of the 'Faune Entomologique Française' (Lépidoptères Héterocères, Noctuæ, 12mo, Paris: 1870, pp. 263, pls. 39-46), discusses the *Noctuidæ*, from the *Cosmiidæ* to the *Poaphilidæ*.

RAMBUR, Ann. Soc. Ent. Fr. (5) i., describes in detail the following *Noctuidæ*, briefly characterized by him, l. c. (4) x. Bull. pp. xxx & xxxi & lxxviii: — *Triphæna sarmata*, p. 315, *Cerastis rubigo*, p. 317, *Cerigo amathusia*, p. 319, *Valeria* (?) *spilogramma*, p. 321.

MILLIÈRE (Ann. Soc. L. Lyon, n. s., xviii.) figures and describes the transformations of *Phyllophila obliterated*, p. 27, pl. 103. figs. 13-15; *Xylocampa lithorhiza*, p. 29, pl. 104. figs. 1-3; *Polyphænis sericina*, p. 32, pl. 104. figs. 4-8; *Heliothis nubigera*, p. 35, pl. 104. figs. 9 & 10.

BEHR (Tr. Am. Ent. Soc. iii. pp. 23-28) gives a synopsis of the *Noctuidæ* hitherto observed in California, including some new species.

Lists of *Noctuæ*: of Morayshire, by G. Norman, and of Paisley, by J. Dunsmore, Scot. Nat. i. pp. 16-19; taken at sugar at Elberfeld, Maassen, S. E. Z. xxxii. pp. 26-28.

Eudryas grata and *unio*. Larvæ and imago of the former described and figured by Riley, Rep. Ins. Miss. ii. pp. 83-85.

Acronycta auricoma. A very small specimen described by Krause, S. E. Z. xxxii. p. 135.

A. leporina. On the direction of the hairs in the larva, see C. G. Bignell, Rep. Plym. Inst. iv. pp. 155 & 156.

A. obliterata, Sm. & Abb. Transformations figured and described by Riley, l. c. iii. pp. 70-72.

A. americana, Harr., is quite distinct from *acericola*, Guén.: *id. ibid.* p. 121.

Leucania albipuncta, Harr. Transformations figured and described by Riley, l. c. ii. pp. 41-50.

Tapinostola elymi. Larva described by W. Buckler, Ent. M. M. viii. pp. 68 & 69.

Mamestra picta, Harr. Larva and imago figured and described by Riley, l. c. ii. pp. 112 & 113.

Aporophila nigra, Haw., new to Holland, P. C. T. Snellen, Tijdschr. Ent. (2) vi. p. 181.

Miana arcuosa. Larva described by Buckler, l. c. vii. p. 260.

Caradrina blanda (auctt. angl.). F. B. White refers this species to *C. taraxaci*, H. (= *blanda*, Tr.), Faun. Perth. p. 15.

Agrotis. For account of a species destructive to crops in Tasmania, cf. P. R. Soc. Tasm. 1870, pp. 32 & 33.

A. helvetina, Boisd., has occurred in England. Described by Knaggs, Ent. Ann. 1872, pp. 115 & 116.

A. segetum and other similar larvæ are sometimes attacked by a fungus: Cohn, JB. schles. Ges. xlvii. pp. 184 & 185.

- A. corticea*. Natural history given by Buckler, *l. c.* viii, pp. 89 & 90.
- A. telifera*, Harr., probably = [*h*] *ypsilon (suffusa)*, Zeller, S. E. Z. xxxii. p. 177.
- A. comes*, Hübn. The Scotch form is not specifically distinct: Knaggs, Ent. Ann. 1872, p. 111.
- Tryphaena curtisi*. Larva described by Newman, Ent. v. pp. 223-225.
- T. fimbria* and *janthina* are not true *Triphaenæ*, but are related to *Cerastis*: Rambur, Ann. Soc. Ent. Fr. (5) i. p. 316 and note.
- Noctua umbrosa*, Natural history by Buckler, Ent. M. M. viii. pp. 139-141.
- N. serici*, Thunb. & Fabr. Keferstein remarks upon this unidentified Japanese species, S. E. Z. xxxii. pp. 327 & 328.
- N. clandestina*, Dru. Larva described by W. Saunders, Canad. Ent. iii. p. 35.
- Taeniocampa gothicina*, H.-S. This species (or var. of *T. gothica*?) has occurred in Morayshire: G. Norman, Ent. M. M. viii. p. 39; Ent. Ann. 1872, pp. 114 & 115.
- Anchocelis helvola*, var. *rufa*, noticed by F. B. White, Faun. Perth. p. 17.
- Cerastis vaccinii*. On the forms of this species. *Id. ibid.* note.
- Eremobia ochroleuca*. Larva described by Buckler, *l. c.* pp. 21 & 22.
- Prodenia commeinæ*, Abb. Larva and imago figured by Riley, Rep. Ins. Miss. iii. p. 113.
- Aplecta nebulosa*, ♀, Vallette records a malformation, Ann. Soc. Ent. Fr. (5) i. Bull. p. lxxvi.
- A. occulta*, var., captured at sea, 220 miles from Nova Scotia: Pr. E. Soc. 1871, p. xxxv.
- Crymodes exulis* and *Pachnobia alpina*. Perhaps survivors of the glacial period in Britain. The latter is apparently distinct from *P. hyperborea*, Zett. F. B. White, Faun. Perth. pp. 14 & 16.
- C. exulis* is remarked on in Ent. M. M. vii. pp. 255 & 256, and by Birchall, in Rep. Br. Ass. 1870, p. 112.
- Dianthæcia magnoliæ*, Boisd. On its larva, see Wullschlegel, S. E. Z. xxxii. pp. 406-408; Mitth. schw. ent. Ges. iii. pp. 330-332.
- Xylina furecifera*. Natural history by Buckler, *l. c.* pp. 114-116.
- X. hepatica*. Larva injurious to hemp in Italy: Bertoloni, Mem. Ac. Bologn. (2) x. pp. 198-208.
- Heliothis armigera*. Transformations figured and described by Riley, Rep. Ins. Miss. iii. pp. 104-109. Larva mischievous to harvests at Sos: Fallou, Ann. Soc. Ent. Fr. (5) i. Bull. pp. liii & liv.
- Hydrelia numerica*, Boisd. Goossens figures and describes the larva, *ibid.* p. 291, pl. 4. f. 6.
- Plusia preactionis* bred from thistle by Riley; some specimens come very near to *P. iota* and *P. u-breve*: Rep. Ins. Miss. ii. p. 112 and note.
- Anomis xyliua*, Say. Transformations figured and described, *id. ibid.* pp. 37-41.
- Amphipyra pyramidoides*, Guén. Transformations figured and described; *A. inornata*, Grote, is a var. of it: *id. ibid.* pp. 72-75.
- Letis xyliu* Guén.? or sp. n.?, from Pebas, described by Packard, Rep. Peab. Ac. ii. & iii. p. 87.

Erebus odora, L., and *Bolina jucunda*, Hübn.?, are recorded from California by Behr, Tr. Am. Ent. Soc. iii. pp. 24 & 25.

New genera and species :—

Ochropacha, Wallengren, Skand. Het. ii. 2. p. 229. Type *Cymatophora duplari*, L.

Agasizia, Behr, Tr. Am. Ent. Soc. iii. p. 23. Allied to *Boletobia*. Type *A. urbicola*, sp. n., California.

Leucania rubripennis, Grote & Robinson, *ibid.* p. 179, pl. 2. fig. 77, Texas.

Acronycta populi, Riley, Rep. Ins. Miss. ii. pp. 119–121, Missouri; transformations described, larva and imago figured. *A. dissecta* and *verrilli*, Grote & Robinson, Tr. Am. Ent. Soc. iii. p. 178, pl. 2. figs. 81 & 82, Massachusetts; *luteicoma*, *iid. ibid.* p. 179, pl. 2. fig. 83, Atlantic district; *funeralis* (= ? *A. albi*, var.), *iid. ibid.* p. 179 [hab. — ?].

Prodenia autumnalis (and varr. *fulvosa* and *obscura*), Riley, *l. c.* iii. pp. 109–117, Missouri: described and figured in all stages.

Xylina cinerea, *id. ibid.* pp. 134–136, Missouri: larva and imago figured.

Agrotis quadridentata, p. 491, pl. 3. figs. 2 & 3, *cicatricosa*, p. 492, pl. 3. fig. 4, Colorado Territory, Grote & Robinson, Proc. Ent. Soc. Phil. iv.; *A. depressa* (misprinted *repressus*), Grote, Canad. Ent. iii. pp. 192 & 193 (with description of larva by W. Saunders).

Bombyx agavis, Blasquez, Nat. Mex. pt. 14, pp. 285–288, pl. 5. f. 6–12, Mexico (is a *Noctua* allied to *Tethea*; cf. Boisduval, Pet. Nouv. iii. p. 163).

Heliothis citrinella, Grote & Robinson, Tr. Am. Ent. Soc. iii. p. 180, pl. 2. fig. 79, Texas.

Anthracia thoreau, *iid. l. c.* p. 181, pl. 2. fig. 80, Atlantic district.

Taruche cretata, *iid. ibid.* fig. 78, Texas.

Crino dissimilis, Grote, *l. c.* p. 183, Cuba.

Anarta luteola, Grote & Robinson, Proc. Ent. Soc. Phil. iv. p. 493, pl. 3. figs. 5 & 6, Canada West.

Heliaca callicore (Led. MS.), Staudinger, Cat. Lep. Eur. p. 128, Lydia, Pontia.

Plusia brassica, Riley, Rep. Ins. Miss. ii. pp. 110–112, Missouri, described and figured in all stages.

Amphipyra conspersa, *id. l. c.* iii. p. 75, Missouri.

Spintherops cerealis (Led. MS.), Staudinger, Cat. Lep. Eur. p. 139, Syria.

Homoptera salicis and *rosæ*, Behr, Tr. Am. Ent. Soc. iii. p. 28, California (larvæ also noticed).

Hypogramma (?) *ambigua*, Gerstäcker, Arch. f. Nat. xxxvii. p. 361, Zan-zibar.

Bolina hadeniformis, Behr, *l. c.* p. 25, California.

Syneda ochracea, *nubicola*, p. 25, *maculosa*, California, *mexicana*, Mazatlan, *tejonica*, p. 26, and *stretchi*, Virginia City, Nevada, *socia*, *adumbrata*, *divergens*, p. 27, and *edwardsi*, p. 28, California, *id. l. c.*; *S. hudsonica*, Grote & Robinson, Proc. Ent. Soc. Phil. iv. p. 494, pl. 3. figs. 7 & 8, Hudson's Bay Territory.

Catocala zoe, *stretchi*, and *irene*, Behr, *l. c.* p. 24, California.

Erebus marquesi (Paulsen, MS.), Philippi, S. E. Z. xxxii. p. 290, pl. 3. fig. 5, Chili.

Capnodes californica, Behr, l. c. p. 23, California.

GEOMETRIDÆ.

STAUDINGER, Cat. Lep. Eur., proposes the name *Songarica* for an uncharacterized genus, type *mollicularia*, Ev., p. 169; *bremeraria* for (*Orthostixis*) *latata*, Brem., nec F., Amur, p. 155; *menetriesi* for (*Boarmia*) *roboraria*, var., Mén., E. Siberia, p. 165; *millier*[*i*]*ata* for (*Eupithecia*) *expressaria*, Mill., nec H.-S., Ardèche, p. 200; *ibericata* for (*Cidaria*) *alfacariata*, Ramb., nec Staud., Spain, p. 187, and *lugubrata* for *luctuata*, auct., nec Hübn. Beitr., Europe, N. Asia, p. 189.

ESCHOFF, Bull. Mosc. xliii. p. 316, proposes the name *Eversmannia* for an uncharacterized genus, type (*Idea*) *exornata*, Ev., and *kindermannii* for (*Synopsisia*) *serrularia*, Led., nec Ev., Altai. He also (l. c. pp. 315-318) publishes the following notes on the species described by Eversmann:—*Ennomos rectistrigaria* is to be referred to *Acidalia*, *E. acuminaria* to *Epione*, *Amphydasis lanaria* to *Biston*, *Fidonia suburraria* to *Thamnonoma*, *F. grisolaria* to *Eubolia*, *Acidalia appensata* to *Lobophora*, *Larentia mollicularia* to ? *Dasydia*, and *Cabera stemmataria* to *Gnophos*; *Acidalia vitellinaria*=*mannerheimiata*, Sedakoff, MS., *A. affectata*=*Scotosia vetulata*, *A. filaria*=*Cidaria fumata*, Ev., = *C. rubidata*, S. V., var., *Ennomos temperata*=? *Gnophos dumetata*, Tr., *Fidonia pruinaria*=*Anaitis sororiaria*, var. *paludata*, Thunb., *F. serrularia* (nec Led.)= *Synopsisia phæoleucaria*, Led., *F. circumflexaria*=*Thamnonoma wavararia*, *Minoa infusata*=*Lithostege odessaria*, Boisd., = *griseata*, var., *Boarmia psoricaria*=? *Scodonia favillacearia*, Hübn., var., *Aspilates flavidaria*=? *Eubolia arenacearia*, S. V., var., *Larentia tæniolata*=*ligaminata*, Ev., *Cidaria pomariaria*=*quadrifasciaria*, Hübn.

Chærodes transversata, Walk., and *Halia wavararia*, Godt. Habits described by Packard, Rep. Mass. Board Agric. 1870, p. 11.

Selenia illunaria sometimes triple-brooded: Ent. v. p. 445.

Eugonia erosaria. An aberration described by Krause, S. E. Z. xxxii. p. 136.

Phigalia pilosaria. On its habits and transformations, see W. H. Smith, Ent. v. pp. 336 & 337.

Nyssia lupponaria, Boisd., has occurred at Rannoch, in Perthshire, and is described by F. B. White, Faun. Perth. p. 21. See also Knaggs, Ent. Ann. 1872, pp. 116-118, and Ent. M. M. vii. p. 282, viii. pp. 16 & 17.

N. zonaria. On a ♂ coupling with and fertilizing 2 ♀s, see Goossens, Ann. Soc. Ent. Fr. (5) i. Bull. p. xxi.

Dasydia obfuscata. Natural history by J. Hellins, Ent. M. M. viii. pp. 20 & 21.

Cleogene lutearia, F. An hermaphrodite described and figured by Fallou, Ann. Soc. Ent. Fr. (5) i. pp. 107 & 108, pl. 2. fig. 3.

Nemoria herbaria. Larva described and figured by Goossens, *ibid.* p. 291, pl. 4. f. 5.

N. viridata. Larva described by E. Newman, Ent. v. pp. 383-385.

Ephyra strabonaria, Zell., has occurred in England, but is a second brood of *trilinearia*: Newman & Doubleday, Ent. v. pp. 225 & 226.

Gnophos variegata, Dup. A var. from Rome is described under the name *cymbalaria*, and figured by Millière, Ann. Soc. L. Lyon, xviii. p. 57, pl. 106. figs. 12-15.

Acidalia. Larvæ described: *A. trigeminata* by Buckler, Ent. M. M. viii. p. 22; *prataria* by Newman, Ent. v. pp. 358-360; *strigilata*, *rubricata*, *immutata*, *subsericeata*, and *mancuniata* by G. T. Porritt, Ent. M. M. viii. pp. 91 & 92, and Ent. v. pp. 275 & 276, 408 & 409, 453-455; *emutaria* by A. B. Farn, Ent. v. p. 408.

A. circuitaria, Hüb. A var. from S. France and Corsica described under the name *chimæaria* and figured by Millière, Ann. Soc. L. Lyon, xviii. p. 47, pl. 105. figs. 23-28.

A. circellata, Guén., figured and described with larva, *id. l. c.* p. 50, pl. 106. figs. 1-3.

Cabera exanthemaria. Larva described by G. T. Porritt, Ent. v. pp. 317 & 318.

Aleucis pictaria. Life-history by Newman, *ibid.* pp. 382 & 383.

Aventia flexularia, Hüb. Newman describes the larva, and remarks on the synonymy of this species, which is not *flexula*, Fabr. He proposes for it the generic name *Craspedocampa*, and considers it to be most nearly allied to *Metrocampa margaritata*: *ibid.* pp. 334-336.

Aspilates gilvaria. Natural history by J. Hellins, Ent. M. M. viii. pp. 116 & 117.

Thysanodes phryganea. Rambur, Ann. Soc. Ent. Fr. (5) i. pp. 323-325, describes in full this genus and species, briefly characterized by him, *l. c.* (4) x. Bull. p. xxxi.

Hybernia aurantiaria. Natural history by W. Buckler, Ent. M. M. viii. pp. 90 & 91.

Anisopteryx vernata, Pack. Transformations described and figured by Riley, Rep. Ins. Miss. ii. pp. 94-102. *A. pomataria*, Harr., is a var. of it.

Eupithecia. Larvæ described: *E. irriguata* by H. H. Crewe, Ent. v. p. 348, Zool. s. s. p. 2812; *E. silenata* and *tresignaria*, H.-S., *laquearia*, H.-S. (= *perfidata*, Mann., = *merinata*, Guén.), 3 vars. of larvæ; *cauchyata*, Dup., and *austerata*, Freyer, by Dietze, S. E. Z. xxxii. pp. 139 & 140, 207 & 208, 278 & 279; *E. pyreneata*, *pulchellata*, *dodoneata*, and *chloerata*, by Goossens, Ann. Soc. Ent. Fr. (5) i. pp. 287-290, pl. 4. figs. 1-4.

DIETZE (*l. c.* pp. 209-211) publishes a list of 53 species of *Eupithecia* found near Frankfort-on-Main and Wiesbaden, with remarks on several of them.

Thera firmata. Larva described and figured by Goossens, Ann. Soc. Ent. Fr. (5) i. p. 294, pl. 4. fig. 8.

Campptogramma fluviata. Natural history by J. Hellins, Ent. M. M. vii. pp. 279-281.

Lobophora viretata, Hüb. Larva described by De Rooy, Tijdschr. Ent. (2) vi. pp. 179 & 180.

Phibalapteryx lignata and *lapidata*. On their natural history, see Hellins, *l. c.* viii. pp. 18 & 19, 165 & 166.

P. aquata. Larva discovered by Berce, Pet. Nouv. ii. p. 135.

Cidaria populata. On a form of this species approaching *C. dolata* (auct. angl.), see F. B. White, Faun. Perth. p. 26.

- C. suffumata*. A variety described by G. T. Porritt, Ent. M. M. viii. p. 39.
C. incultaria, H.-S. Natural history by E. Hofmann, S. E. Z. xxxii. pp. 43 & 44.
C. blomeri, Curt., and *Bapta* (*Odezia*) *cethiopata*, Scop. Keferstein remarks on these species, S. E. Z. xxxii. p. 326.
Lithostege griseata. Life-history by Newman, Ent. v. pp. 379-382.
Chesias spartiata and *obliquaria*. Larva described by W. Buckler, Ent. M. vii. pp. 260-262.
Hyperetis alienaria, H.-S. Larva described by Saunders, Canad. Ent. iii. pp. 209 & 210.
Priocycla armataria, H.-S. Larva described and imago figured, *id. l. c.* pp. 130 & 131.

New genera and species :—

- Parenomos*, Packard, Rep. Mass. Board Agric. 1870. Allied to *Ennomos*. Type *P. piniata*, sp. n., *l. c.*, Massachusetts, Canada. [Surely nothing but confusion can be expected from the needless repetition of this and other specific names within the same family.]
Priocycla bilinearia, Packard, *l. c.*, Massachusetts.
Paraphia piniata, *id. l. c.*, Ontario, Canada.
Fidonia fimetaria, Grote & Robinson, Tr. Am. Ent. Soc. iii. p. 182, pl. 2. figs. 84-86, Texas.
Acidalia mancipiata, Staudinger, Cat. Lep. Eur. p. 147, Andalusia; *A. persimilis* and *purpurissata*, Grote, Canad. Ent. iii. p. 103, Alabama; *A. cervan-taria*, Millière, Ann. Soc. L. Lyon, xviii. p. 21, pl. 103. figs. 1-3, Barcelona, and *romanaria*, *id. l. c.* p. 52, pl. 106. figs. 4-11, Rome.
Zerene piniaria, Packard, Rep. Mass. Board Agric. 1870, Massachusetts, Canada.
Eupithecia suntolinata and *pyreneata*, Mabille, Pet. Nouv. iii. p. 168, Pyrenees.

PYRALIDÆ.

WALLENGREN, Öfv. Vet. Ak. xxviii. pp. 961-1060, briefly describes the Scandinavian species of this family and of the *Choreutidæ*. Sectional and generic characters and synonymy (none of the latter apparently original) are also given. No new species are described.

ERSCHOFF (*l. c.* p. 319) determines Eversmann's *Pyralidæ* as follows:—*Phycis fumella*=*Nephopteryx rhenella*, Zinck.; *P. fulvostrigella*=*fronticornella*, H.-S.; *P. laternella*=*ilignella*, Zell.; *P. grossulariella*=*convolutella*, Hübn.; *P. plumbaginella*=*tetricella*, Hübn.; *Myelephila sedakovella*=*Myelois flaviciliella*, H.-S.

HERRICH-SCHÄFFER has published another paper on the Cuban species, describing many as new, and noticing many others previously known: OB. Ver. Regensb. xxv. pp. 15-30.

GROTE redescribes *Botys argyralis*, Hübn., *B. ecclesiæ*, Guén., and *Pilochrosis ramentalis*, Led.: Canad. Ent. iii. p. 125.

Pyralis furinalis. Larva described and figured by Goossens, Ann. Soc. Ent. Fr. (5) i. p. 292, pl. 4. fig. 7.

Desmia maculalis, Westw. Transformations described and figured by Riley, Rep. Ins. Miss. iii. pp. 61-63.

Phacellura nitidalis, Cr., figured and described in all stages, *id. l. c. ii.* pp. 64-70.

Botys. An undetermined specimen described by Peyerimhoff, Pet. Nouv. iii. p. 168.

B. diffusalis, Guén. Transformations given by Millière, Ann. Soc. L. Lyon, n. s., xviii. p. 28, pl. 103. figs. 8-12.

Glyphodes zelleri, Brem., nec Led., from the Amur, is renamed *bremeri*: Wocke, Cat. Lep. Eur. p. 213.

Scopula lutealis (auct. angl.) is apparently confounded by Staudinger with *elutalis*, W. V.: F. B. White, Faun. Perth. p. 28, note,

Acentropus. An exhaustive analysis of the literature of this genus, by C. Ritsema, Tijdschr. Ent. (2) vi. pp. 156-172.

Aphomia sociella. The larvæ inhabit wasps' (not bees') nests, and live upon the substance of the nest: F. B. White, Faun. Perth. p. 29.

Anerastia lotella, Hübn., destructive to rye and wheat in Prussia: Zeller, S. E. Z. xxxii. pp. 161 & 162; Kühn, Z. Landw. Sachs. 1870, no. 6; cf. CB. Ver. Regensb. xxv. pp. 30-32.

Ephestia interpunctella. On the food of the larva, and the damage caused by it to biscuit &c., see Fallou & Ragonot, Ann. Soc. Ent. Fr. (5) i. Bull. pp. xxiv & lxx.

Homæosoma saxicola, Vaughan. Larva feeds on the flowers of *Matricaria inodorata*, and probably of other plants: Gregson, Ent. v. pp. 396 & 397; F. B. White, Ent. M. M. vii. p. 231.

Rhodopheæa marmorella bred by J. B. Hodgkinson, Ent. M. M. viii. p. 71.

Hypochalcia melanella. Larva described by Eppelsheim, S. E. Z. xxxii. pp. 316 & 317.

Gymnancycla canella. Transformations described by W. Buckler and H. Moncreaff, Ent. M. M. viii. pp. 163-165; Ent. v. pp. 430 & 431.

Pempelia albariella, Zell. W. E. Davis and H. G. Knaggs record its occurrence in Britain [but the correct identification of the species has recently been questioned] and describe it: Ent. M. M. viii. pp. 162 & 163; Ent. Ann. 1872, pp. 118 & 119.

Pempelia grossulariæ, Packard, is probably not a *Pempelia*, and possibly = the European *Myelois convolutella*: Zeller, S. E. Z. xxxii. p. 177.

Phycis rhenella, Dup. (? Zinck.). See Peyerimhoff, Pet. Nouv. iii. p. 139.

Crambus alpinellus, Hübn. Vaughan & Knaggs record its occurrence in Britain: Ent. M. M. viii. p. 110; Ent. Ann. 1872, p. 118, fig. 4.

Crambus satrapellus and *bipunctellus*, Zell., are described by Robinson, Ann. Lyc. N. York, ix. pp. 315 & 316.

Schænobius melinellus, Clem., redescribed, and *S. aquilellus*, Clem., nec Tr., renamed *clemensellus*, by Robinson, Ann. Lyc. N. York, ix. p. 313.

New species :—

HERRICH-SCHÄFFER (CB. Ver. Regensb. xxv.) describes as new from Cuba:—*Asopia tripartitalis*, p. 16; *Hellula simplicialis*, *Deuteroltyta majuscula*, p. 17; *Botys graminialis*, p. 18, *geminatalis*, *germanalis*, *episcopalis*, p. 19, *glirialis*, *gracilialis*, *harpalis*, *semifulvalis*, p. 20, *subviolalis*, *subaurantialis*, *subhya-*

linalis, *tiliaralis*, p. 27, *hesperialis*, *idonealis*, p. 28, *dilutalis*, *illepidalis*, *impeditalis*, *impulsalis*, *impuralis*, *infixalis*, p. 29, *lualis*, p. 30; *Phakullura marianalis*, p. 21; *Cænostola quadrifenestralis*, p. 21; *Lineodes gracilalis* and *multisignalis*, p. 22; *Desmia sertorialis*, *impuralis*, *quadrinotalis*, p. 24, *personalis* and *pervialis*, p. 25; *Cataclysta minimalis* and *plusialis*, p. 26.

Hyphenia californica, Behr, Trans. Am. Ent. Soc. iii. p. 23, California.

Cataclysta robinsoni, Grote, Canad. Ent. iii. p. 181, Alabama.

Desmia subdivisalis, *id. l. c.* p. 126, Alabama.

Botys syringicola, Packard, Rep. Mass. Board Agric. 1870, New York (habits also described); *B. plumbicostalis* and *B. anticostalis*, Grote, *l. c.* pp. 103 & 104, Alabama.

Ephestia figulilella [vox hybrida], Gregson, Ent. v. p. 385, Liverpool.

Phycis davisellus, Newman [= *Pempelia albariella* (Zell. ?), *vide ante*], Ent. v. p. 444, Isle of Wight.

Crambus zermattensis, Frey, Mitth. schw. ent. Ges. v. p. 244; S. E. Z. xxxii. p. 101, Zermatt; *C. minimellus*, Robinson, Ann. Lyc. N. York, ix. p. 315, Pennsylvania.

Schænobius dispersellus, p. 313, New York and Texas, *unipunctellus* and *tripunctellus*, p. 314, Texas: Robinson, Ann. Lyc. N. York, ix.

TORTRICIDÆ.

Euryptychia saligneana, Clem., redescribed and figured (with gall) by Riley, Rep. Ins. Miss. ii. pp. 134 & 135.

Grapholitha oculana, Harr., and *Tortrix incertana*, Clem., habits described by Packard, Rep. Mass. Board Agric. 1870; *G. oculana* and larva figured by W. Saunders, Canad. Ent. iii. p. 13.

Penthina metallicana, Hübn., var. *irriguana*, H.-S., has occurred in Scotland: Ent. M. M. vii. p. 255; Ent. Ann. 1872, pp. 119 & 120.

Penthina vitivorana, Packard, = *Eudemis botrana*, Zeller, S. E. Z. xxxii. p. 178.

Enophthira pilleriana. Habits, transformations, and ravages described in Atti Soc. Agric. Gorizia, 1870.

Anchylopera fragariae, Walsh, = *comptana*, Zeller, S. E. Z. xxxii. p. 178.

Peronea comariana, *proteana*, and *potentillana*. Von Nolcken's remarks on these species are translated in Ent. M. M. vii. p. 233.

Carpocapsa pomonella and *putaminana*, Staud., possess a pencil of hair on the upperside of the hind wings of ♂. The former occurs in N. America and in Brazil as well as in Europe, while the latter is widely distributed in the Mediterranean region (where it feeds on walnuts), and may also be expected to occur in S. Austria and the Rhine district. Zeller, *l. c.* pp. 55 & 56. *C. pomonella* is stated by Laboulbène to attack nuts: Ann. Soc. Ent. Fr. (5) i. p. 295; *ib.* Bull. p. lxxxv. On its habits &c., see also Riley, Rep. Ins. Miss. iii. pp. 101-104, and Saunders, Canad. Ent. iii. pp. 26, 27, for remarks upon, and figures of, its transformations.

Opadia fumebrana. On rearing, see C. G. Barrett, Ent. M. M. vii. p. 257.

Tortrix penziana, Hübn. Larva described by Wulschlegel, Mitth. schw. ent. Ges. iii. p. 327; S. E. Z. xxxii. p. 403.

Teras mixtana, Hübn.: a var. from S. France, described under the name *provinciana*, by Peyerimhoff, Mitth. schw. ent. Ges. iii. p. 410.

Grapholitha (Sericoris) tiedemanniana, Zell., occurs near Stettin; *G. roseticolana*, Zell., and *G. (Semasia) conterminana*, H.-S., habits and larvæ described: Zeller, *l. c.* pp. 56-62. Eppelsheim also describes the transformations of *G. roseticolana*: S. E. Z. xxxii. pp. 315 & 316.

G. pusillana, Pey. Redescribed in full by Peyerimhoff, *l. c.* p. 410.

Eupæcilia. On the variation of habit in the larva, see C. S. Gregson, Ent. v. pp. 242 & 243.

Tortrix v-signatana and *oxycoccana*, Massachusetts, and *vaccinivorana*, New Jersey, Packard, Rep. Mass. Board Agric. 1870: spp. nn.

Teras cyaneana, sp. n., Peyerimhoff, *l. c.* p. 409, Switzerland.

Conchylis frauenfeldi, sp. n., Mann, Verh. z.-b. Wien, xxi. p. 80, Ural.

Dicrorampha harpeana, sp. n., Frey [also described by Staudinger, B. E. Z. xiv. p. 283, ♀ previously], Mitth. schw. ent. Ges. v. p. 246; S. E. Z. xxxii. p. 103, Switzerland. *D. rheticana*, Frey, *l. c.*, S. E. Z. xxxii. p. 104, Engadine.

Grapholitha caryæ, Shimer, Trans. Am. Ent. Soc. ii. p. 394, Illinois (Rec. Am. Ent. 1869, p. 28).

Phoxopteryx paludana, Barrett, Ent. M. M. viii. p. 134; Ent. Ann. 1872, pp. 120 & 121, fig. 5, Britain.

TINEIDÆ.

HERRICH-SCHÄFFER reviews Stainton's Natural History of the Tineina, vol. xii., with many critical observations. CB. Ver. Regensb. xxv. pp. 43-48.

V. T. CHAMBERS publishes notes on the N. American species of *Lithocolletis*, *Leucanthiza* (= *Lithocolletis* ?); *Phyllocnistis*, *Tischeria*, *Cemistoma*, *Laverna*, and *Aspidisca*. Canad. Ent. iii. pp. 54-58, 84-88, 127-130, 146-149, 161-166, 182-185, 205-209, 221-224.

STAINTON (Ent. Ann. 1872, pp. 122 & 123) records two species of *Tineina* as new to Britain, one being new to science.

Exapate gelatella bred from *Rhamnus catharticus*. J. E. Fletcher, Ent. M. M. vii. p. 188.

E. duratella, v. Heyd. Compare Frey, Mitth. schw. ent. Ges. v. p. 408.

Chimabache fagella. The larva stridulates, perhaps by rubbing its 3rd pair of legs, which are enlarged at the extremities, against some hard substance. Peyerimhoff, Pet. Nouv. iii. p. 155.

Æta compta, Clem. Zeller compares it with *Tinea punctella*, Cr., (= *T. pustulella*, Fabr.): S. E. Z. xxxii. p. 178.

Solenobia triquetella and *lichenella*. Von Siebold devotes ch. v. of his Beitr. z. Parthen. d. Arthrop. to these species (pp. 145-159). On parthenogenesis in these species, see also Hartmann, Kleinschmetz. Umg. Münch. pp. 9-14. The latter is possibly only the parthenogenetic ♀ of *S. pineti* (*l. c.* p. 45).

Tinea spretella. Transformations described, JB. Mus. Kärnt. 1870, no. 12.

Nemophora reaumurella, Peyerimhoff, redescribed by him, Mitth. schw. ent. Ges. iii. p. 411.

Idophasia, *Plutella*, and *Cerostoma*. 13 species found in Ober-Lausitz are described, and the neururation of their wings figured by H. B. Möschler, Abh. Ges. Görl. xiv. pp. 57-67.

Plutella cruciferarum. On its occurrence in Scandinavia and Spitzbergen, see A. E. Holmgren, Sv. Ak. Handl. (2) viii. (5) pp. 25 & 26.

Teichobia verhuellella. On the larva, see C. G. Barrett, Ent. M. M. vii. p. 235.

Swammerdamia. Besides the irrecognizable *S. apicella*, the following 4 species occur near Stettin, *S. spiniella*, Hübn., *heroldella*, Tr., *oxyacanthella*, Dup., and *pyrella*, Vill. Zeller redescribes these in full in their various stages, S.E. Z. xxxii. pp. 67-77.

S. alternana, Staud., is redescribed by Frey, Mitth. schw. ent. Ges. v. p. 277; S. E. Z. xxxii. p. 113.

Idophasia messingiella bred by J. B. Hodgkinson. Ent. M. M. viii. p. 71.

Cerostoma lucella, F., is probably a dimorphous ♀ of some other known species. Zeller, l. c. pp. 62-64.

Depressaria alpigena, Frey, has priority over *D. sileris*, Pfaff.: Frey, Mitth. schw. ent. Ges. v. p. 295; S. E. Z. xxxii. p. 130.

Gelechia. Stainton has completed his abstract of Von Heinemann's division of the genus. *G. lathyrella* should be referred to the genus *Brachmia*. Ent. M. M. vii. pp. 169-173.

G. tussilaginelia (Hoffm. MS.), v. Heinem., = *G. tussilaginis*, Frey. Frey, Mitth. schw. ent. Ges. v. p. 294; S. E. Z. xxxii. p. 128.

G. spurcella, H.-S. Natural history by O. Hofmann, S. E. Z. xxxii. pp. 219-221.

G. (Lita) strehitiella recorded as new to Britain: Ent. Ann. 1872, p. 123.

G. gemmella, L. On its occurrence in America, see Riley, Canad. Ent. iii. p. 195, 196.

Coriscium sulphurellum, Haw.: Peyerimhoff, Mitth. schw. ent. Ges. iii. p. 412, describes a var. from S. France under the name *aurantiellum*.

Heliozela stanneella, F. R. Natural History, by O. Hofmann, l. c. pp. 44-47. The genus *Heliozela* is very closely related to *Antispila* and *Incurvaria*.

Antispila rivillii. On the rediscovery of the larva, see Stainton, Ent. M. M. viii. pp. 146, 147; Ent. Ann. 1872, p. 124.

Lyonetia saccatella, Pack., = *Aspidisca splendoriferella*: Chambers, Canad. Ent. iii. p. 223.

Asychna aratella, Zell., and *Laverna decorella*, Steph., are the only known British gall-producing *Lepidoptera*. Müller & Stainton, Ent. Ann. 1872, p. 21.

Walshia amorphella, Clem. Transformations described and figured by Riley, Rep. Ins. Miss. ii. pp. 132, 133.

Lithocolletis mahalebella, Mühl., = *L. cerasicolella*, H.-S.; *L. alpina*, Frey, is distinct from *L. alniella*, Zell.: Frey, Mitth. schw. ent. Ges. v. p. 292; S. E. Z. xxxii. p. 126.

Bucculatrix lavaterella, Mill., is described: *id.* Mitth. &c. p. 284; S. E. Z. xxxii. p. 119.

Nepticula. Von Heinemann has published a paper on this genus in B. E. Z. xv. pp. 209-223, supplementary to that in Wien. Ent. Mon. vol. vi. Many new species are described, *N. alnetella*, Hein., *nec* Staint., is renamed *rubescens* (p. 214), and the following known species are noticed:—*N. rhamnella*, H.-S., *paradoxa*, Frey, p. 211; *nylandriella*, Tengstr., *æneofasciella*, H.-S., *fragariella*, Heyd., p. 212; *ulmivora*, Frey, *marginicolella*, Staint., p. 214; *alnetella*, Staint., p. 215; *sorbi*, Staint., p. 216; *argentipedeella*, Zell., *helianthemella*, H.-S., p. 218; *sericopeza*, Zell., p. 219; *quinquella*, *apicella*, and *argyropeza*, Staint., p. 221. The last 2 species may be identical.

Nepticula sericopeza, Zell. Larva and its habits described by Wocke, S. E. Z. xxxii. pp. 428-430.

New genera and species :—

Psilothrix, Wocke, Cat. Lep. Eur. p. 267. Allied to *Lypusa*. Type *P. dardoinella*, Mill.

Crinopteryx, Peyerimhoff, Mitth. schw. ent. Ges. iii. p. 410. Type *C. familiella*, sp. n., *id. l. c.*, S. France.

Paradozus, Millière, Ann. Soc. L. Lyon, n. s., xviii. p. 42. Type *P. osyridellus*, *id. l. c.* pl. 105. figs. 12–22, Alpes Maritimes. (Figured in all stages, and treated as a new species, but previously described by Stainton in Tin. S. Eur.: *cf.* Zool. Rec. vi. p. 416.)

Incurvaria canariella, Stainton, Ent. Ann. 1872, p. 122, Isle of Man, Germany.

Adela panicensis, Frey, Mitth. schw. ent. Ges. v. p. 247; S. E. Z. xxxii. pp. 104, 130, Glarus; *A. getica*, Mann, Verh. z.-b. Wien, xxi. p. 80, Tultscha.

Ochsenheimeria trifasciata, Wocke, Cat. Lep. Eur. p. 276, Central Italy.

Argyresthia trifasciata, Staudinger, Cat. Lep. Eur. p. 425, Valesia; *A. submontana*, Frey, Mitth. schw. ent. Ges. v. p. 255; S. E. Z. xxxii. p. 112, Switzerland.

Gracilaria fribergensis, Fritsche, S.B. Ges. Isis, 1871, p. 229, Germany (described in all stages).

Depressaria alpigena, Frey, Mitth. schw. ent. Ges. v. p. 248, S. E. Z. xxxii. p. 105, Engadine.

Gelechia vepretella, Zeller, S. E. Z. xxxii. p. 64, Glogau & Stettin; *G. acupediella*, *myricariella*, *diffuella*, *cacuminum* [= *Lita tristella*, von Hein.], and *ferrea*, Frey, Mitth. schw. ent. Ges. v. pp. 250–253, S. E. Z. xxxii. pp. 106–109, Switzerland; *G. squamulella*, Peyerimhoff, Mitth. schw. ent. Ges. iii. p. 412, S. France.

Symmoca ænophila, Staudinger, Cat. Lep. Eur. p. 426, Catalonia.

Öcophora auromaculata, Frey, Mitth. schw. ent. Ges. v. p. 290; S. E. Z. xxxii. p. 110, Engadine; *Ö. lucentella*, Peyerimhoff, *l. c.*, S. France.

Coleophora attalicella, p. 77, Sarepta, and *pratella*, p. 78, pl. 2. fig. 6, Grabow, Zeller, S. E. Z. xxxii.; *C. (P) chypeiferella*, Hofmann, *ibid.* pp. 221, 328, 329, Europe, Sarepta.

Stagmatophora extremella, Wocke, Cat. Lep. Eur. p. 321, N. Dalmatia.

Butalis glacialis, Frey, Mitth. schw. ent. Ges. v. p. 254; S. E. Z. xxxii. p. 111, Switzerland; *B. milleri*, Mann, Verh. z.-b. Wien, xxi. p. 81, Csepreg.

Elachista heinemanni, *juliensis*, *sublimis*, Switzerland, and *pomerana*, Pomerania: Frey, Mitth. *l. c.* pp. 278–280, 282; S. E. Z. xxxii. pp. 114–117.

Cemistoma albella, Chambers, Canad. Ent. iii. p. 23, Kentucky.

Tischeria heinemanni, Wocke, Cat. Lep. Eur. p. 333, Germany.

Chauliodus staintonellus, Millière, Ann. Soc. L. Lyon, n. s., xviii. p. 45, pl. 105. figs. 1–11 (figured in all stages).

Bucculatrix valesiaca and *alpina*, Frey, Mitth. *l. c.* pp. 283, 285; S. E. Z. xxxii. pp. 118 & 120, Switzerland.

Laverna cephalonhiella, Chambers, Canad. Ent. iii. p. 221, Kentucky.

Aspidisca ella, *id. l. c.* p. 224, Kentucky.

Lithocolletis tilianella, p. 56, *clemensella*, p. 57, *caryæalbella*, p. 58, *virginella*, p. 84, *unifasciella*, p. 108, *bethunella*, p. 109, *tritænianella*, p. 110, *æsculisella* (= *guttifinitella*, Cl., var.), *corylisella*, p. 111, *L. (P) ornatella*, p. 161, *sal-*

cifoliella, p. 163 (described before under this name by Clemens, from the mine only), *ambrosiella*, p. 127, *celtifoliella*, p. 128, *celtisella*, p. 129, *concin-natiella*, p. 146, *ulmella*, p. 148, *id. l. c.*, Kentucky; *L. cerisotella* and *triflorella*, Peyerimhoff, Mitth. schw. ent. Ges. iii. p. 413, S. France.

Leucanthiza saundersella, Chambers, *l. c.* p. 205, Kentucky.

Phyllocnistis vitifoliella and *ampelopsiella*, *id. l. c.* pp. 206 & 207, Kentucky.

Nepticula stettinensis and *uniformis*, p. 210, *tormentillella*, p. 213, *occultella*, p. 215, *albifasciella*, p. 223, Stettin, *wockeella*, *ibid.*, Breslau: v. Heinemann, B. E. Z. xv. *N. gei*, Wocke, Cat. Lep. Eur. p. 336, Germany; *N. filipendulæ*, Wocke, *l. c.* p. 338, Silesia. *N. schleichiella*, Frey, Mitth. schw. ent. Ges. v. p. 286; S. E. Z. xxxii. p. 121, Switzerland. *N. palustrella* [= *N. comari*, Wocke, 1862: v. Wocke, *l. c.* p. 337]; *N. geminella* and *N. pyri* (Glitz, MS.), Frey, Mitth. pp. 287-289; S. E. Z. xxxii. pp. 122 & 123, Germany and Switzerland. *N. ilicivora* and *cistivora*, Peyerimhoff, Mitth. schw. ent. Ges. iii. pp. 413 & 414, S. France.

Micropteryx pomivorella, Packard, Rep. Mass. Board Agric. 1870, Massachusetts.

PTEROPHORIDÆ.

Agdistes bennetti. Larva described by H. Moncreaff, Ent. v. pp. 321 & 322.

Pterophorus isodactylus, *teucræi*, *plagiodyctylus*, and *lienigianus*. Barrett describes their habits in their various stages very fully, and casually remarks on the great difference in habit of the larvæ of these and other species of the genus. Descriptions of the larvæ of the above are added by Buckler, Ent. M. M. viii. pp. 153-158.

P. periscelidactylus, Fitch, is an *Oxyptilus*, and *P. carduidactylus*, Riley, a *Platyptilus*: Zeller, S. E. Z. xxxii. pp. 178, 179. The transformations of the former species are described and figured by Riley, Rep. Ins. Miss. iii. pp. 65-68.

Platyptilus. R. C. R. Jordan remarks on the obscurity of the identification of *P. trigonodactylus*, *zetterstedti*, and *gonodactylus*, and promises further information. Ent. M. M. viii. pp. 137, 138.

P. cosmodyctylus, Hübn. Frey describes var. *stachydalis* from Zurich. Mitth. schw. ent. Ges. v. p. 290; S. E. Z. xxxii. p. 125.

Pterophorus rogenhoferi, sp. n., Mann, Verh. z.-b. Wien, xxi. p. 79, Great Glockner.

DIPTERA

By E. C. RYE.

LOEW, HERMANN. Beschreibungen europäischer Dipteren. Band ii. (pt. 9 of Meigen's System. Beschr. der bek. eur. zweifl. Ins.). Halle: 1871, 8vo, pp. 319.

The new species contained in this part, to p. 193, were included in Zool. Rec. vii., from sufficient information supplied by the author, and will consequently not be repeated here; but some others from Turkestan, referred to in Zool. Rec. vii., from a list also sent by Loew, as described in Nachr. Ges.

Mosc., being now published as new, without any reference to the last mentioned medium, will be recorded in the usual way.

PERRIS, ÉDOUARD. Histoire des Insectes du Pin maritime. Diptères. Ann. Soc. Ent. Fr. (4) x. pp. 135-232, 320-366, pls. 1-5.

In these two chapters the author employs upon such *Diptera* as he has observed in connexion with *Pinus maritima* the biographical talents that characterize his well-known treatise on *Coleoptera* frequenting that tree. In the spirit of a true observer of nature, he (though describing some new species) in many instances devotes his attention solely to the elucidation of the habits and earlier stages of species indicated (but not described) as new. He figures in outline details of the external anatomy of many species, to which reference will be made hereafter.

SOROKINE, NICOLAS. Recherches sur le développement du *Heli-costylum muscæ*, sp. nov. (Fung.). Bull. Mosc. xliii. pp. 256-262, pl. iv.

Though not strictly a subject for the Zool. Rec., this description of a new fungus, growing from flies that have died from *Empusa muscæ*, may interest entomologists, as supplementing Brefeld's work on that disease. The author appears not to have decided whether it has any connexion with the *Empusa* or is merely a coincident phenomenon.

WALKER, FRANCIS. List of *Diptera* collected in Egypt and Arabia by J. K. Lord, Esq.; with descriptions of the species new to Science. Ent. v. pp. 254-263, 271-275, 339-346.

The "descriptions" are too short to be recognizable.

WEYENBERGH, H. Ueber Fliegenschwärme. Verh. z.-b. Wien, xxi. pp. 1201-1216. [Nog een Paar waarnemingen van vliegenschwormen, benevens een overzicht van alle tot heden waargenomen vliegenschwormen. Tijdschr. Ent. (2) vi. pp. 221-231.]

A compilation (with commentary) upon the various recorded accounts of swarms of *Diptera*, from 1736 to the present time. 16 accounts of such gatherings of *Culicidæ* are mentioned, *Culex pipiens* being the only certain species; and 13 of other *Diptera*, of which the genus *Chlorops* supplies the most instances (*C. lineata*, *lata*, and *nasuta*), *Musca* (*domestica* and *corvina*) and *Pollenia* (*atramentaria* and *vespillo*) being the only others; but the species seem in almost all cases to be somewhat uncertainly referred. The English swarms (except in one instance) appear to be all *Culicidæ*. Some cuts of fly-traps are given, avowedly on the scheme of the moth-trap mentioned in Ent. M. M. vii. p. 276.

WULF, F. M. VAN DER. Overzicht van Dr. Schiner's jongste Stelsel der benamingen voor het aderbeloop der Vleugels van *Diptera*. Tijdschr. Ent. (2) vi. pp. 79-98, pls. 2 & 3. 1871. [VOL. VIII.] 2 D

In this useful paper, the author enters at length upon the nomenclature of alar cells and nervures, comparing the various terms employed by Meigen, Macquart, Winnertz, and Schiner, and especially commenting upon the latter author's most recent "Adersystem." He establishes a formula of his own, founded upon Schiner's, and gives clearly executed outlines of the wings of *Cordylura*, *Dexia*, *Leucostoma*, *Pipunculus*, *Syrphus*, *Asilus*, *Odontomyia*, *Anthrax*, *Tipula*, *Dolichopus*, *Exechia*, *Ceratopogon*, *Macrocera*, *Sciophila*, *Cecidomyia*, and *Phora* as types of the different forms of neururation.

WULP, F. M. VAN DER. *Dipterologische Aanteekeningen*: no. 3. *L. c.* pp. 186-210, pl. 8. figs. 1-11.

Treats of the Dutch *Musca Acalypteræ* and *Phoridæ*. Some new species are described.

Spain and Portugal: rare species are noted by Brannan & Schaufuss; Nunq. Ot. i. p. 156.

Zürich: Dietrich (Ent. Blätt. pp. 7-18) enumerates the species found in this Canton, in continuation of Mitth. schw. ent. Ges. ii. p. 9, giving references to authors, and dates and places of capture. He also (*l. c.* pp. 19-21) gives a list of species occurring at Wallis.

Nova Scotia: Walker (Canad. Ent. iii. pp. 141-144), in a paper headed "Notes on some insects of Nova Scotia and Canada," gives a list of *Diptera*, specifying such of them as also inhabit Europe.

Sheep-parasites: for observations on the "tick," "bot," and blow-flies, *cf.* Ent. v. pp. 306-309.

"Tsetse": under this name, an account of an unidentified African pest [*Glossina morsitans*, Westw.] is given in Ent. v. p. 283.

Tusks of ♀ *Elephas indicus*, near the base of which a mass of egg-like bodies, "apparently of some Dipterous insect, and somewhat resembling those of *Musca vomitoria*," was deposited, are referred to by Slater, Proc. Z. S. 1871, p. 145 (*cf.* also 'Field,' 12 Mar. 1870; and Pr. E. Soc. 1871, p. xviii).

CECIDOMYIDÆ.

Cecidomyia brassicæ, *papaveris*, *destructor*, *nigra*, and *pyri*, *Asynapta lugubris*, *Diplosis pisi* and *tritici*. Künstler (Verh. z.-b. Wien, xxi. Beih. pp. 48, 38, 16, & pp. xxii, 78, 68, 38, & 24) discusses injuries to cultivated plants by these species.

Cecidomyia pini. Perris, Ann. Soc. Ent. Fr. (4) x. pp. 162-170, pl. 1. figs. 28-31, redescribes all the stages, figuring the larva, with details, and supplementing the former accounts of Degeer and others. He considers that the larvæ are not the cause of a disease to which the young pines are subject, and which results in cortical crackings, accompanied by resinous exudation, but that they profit by this complaint when it occurs. This sp., having 26 joints in the antennæ of its ♂, and 14 in its ♀, should certainly form a separate genus, according to Perris, *l. c.* p. 185.

Cecidomyia. Perris (*l. c.* pp. 172-176, pl. 2. figs. 39-44, 45 & 46) describes all the stages of two apparently new spp., figuring details of their larvæ (one of which has saltatorial powers) and the wings of the imago. He does not name these insects, which are from the Landes, and live at the expense of *Hylurgus piniperda* and *Tomicus laricis*. At pp. 176-185 the author

gives a summary of some of the accounts published concerning vegetable excrescences caused by larvæ of *Cecidomyia*: these he divides into true galls and gall-like substances. He mentions *Leucanthemum vulgare*, *Pimpinella magna*, *Laserpitium pruthenicum*, *Anethum fœniculum*, and *Lotus corniculatus* as plants noticed by himself to be affected by the former, and *Linum usitatissimum*, *Thymus serpyllum*, *Ulex europæus*, *Sarothamnus scoparius*, *Euphorbia amygdaloides*, *Veronica chamædrys*, *Mentha rotundifolia*, *Trifolium subterraneum*, *Spiræa ulmaria*, *Poterium sanguisorba*, *Mespilus oxyacantha*, *Origanum vulgare*, *Mentha rotundifolia*, *Lysimachia vulgaris*, *Lychnis diæca*, *Brassica oleracea*, *napus*, and *chiranthus*, *Lotus uliginosus*, *Salix triandra*, *Pteris aquilina*, *Ononis spinosa*, *Hypericum perforatum*, and many *Graminaceæ* and *Synantheraceæ*, as observed by himself to be affected in various ways by the latter. He points out the impropriety of the generic name, and approves of the subdivision of *Cecidomyia* by Rondani, Loew, and Winnertz.

Cecidomyia cerris, Koll., and *circinans*, Gir. Galls described and figured by Mayr (Mitteleur. Eicheng. ii. pp. 53 & 54, t. vi. figs. 77 & 78).

Cecidomyia botularia, Winn. Müller (Gard. Chron. 31 Dec. 1870) notes economy.

Cecidomyia fagi, Htg., *tremulæ*, Winn., and *cauliginella*, Schm. Galls from the Drachenfels discussed: *id.* Ent. M. M. vii. p. 254.

Cecidomyia saliciperda. Economy briefly noticed by Heylaerts, Jr.: Tijdschr. Ent. (2) vi. p. 39.

Cecidomyia pictipennis, Perris, *l. c.* p. 170, pl. 1. figs. 32-38, Landes (accompanying larvæ of *Tomicus ramulorum*); *C. pteridis*, Müller, Ent. M. M. viii. p. 99, England (named from the larva only, which forms galls on fronds of *Pteris aquilina*); *C. campanulæ*, *id.* Pr. E. Soc. 1871, p. viii, Aberdeen, upon *Campanula rotundifolia* (larva only): spp. nn.

Diplosis equestris, sp. n., Wagner, S. E. Z. xxxii. p. 414, pl. 4, Fulda (account of economy given, with figures of details of structure and of the earlier stages, &c.).

MYCETOPHILIDÆ.

Sciara. Perris (*l. c.* pp. 157 & 158) describes, both as larvæ and perfect insects, two species of this genus, apparently new to science, but which he does not name. He compares former accounts of the larvæ of *Sciara*, and believes that their habits are similar to those of *Ceratopogon*.

Sciophila striata. Perris (*l. c.* p. 146, pl. 1. figs. 12-19) describes and figures the early stages of this sp., bred from *Dedulæa maxima* (Fung.), comparing the economy of its larva with that of *S. unimaculata*, Mcq., and noting the apparent want of analogy between the larvæ of spp. in this genus observed by himself to have palpi and mandibles, and those of other species in which these important organs have escaped the notice of former presumably accurate writers.

"*Tipula agarici seticornis*," Deg., is apparently a *Sciophila*: *id. l. c.* p. 154.

Mycetobia pallipes. Perris (*l. c.* pp. 186-190, pl. 2. figs. 47-53) redescribes this species in all its stages, figuring details of the larva, and fully discussing its economy.

Sciara convergens, *id. l. c.* p. 154 (larva, pupa, & im.), pl. 1. figs. 20-27, Landes (feeds on excreta of larvæ of *Tomicus*, societies of the fly-larvæ occurring at the mouth of the beetle's burrow, near which their final change is

made); *S. hispida*, p. 847, *fusca*, p. 849, *cunctans*, p. 850, *glabricollis*, p. 851, *socialis*, p. 852, *æstivalis*, p. 853, *nana* and *formosa*, p. 854, *solani*, p. 855, *opaca*, p. 856, *vana*, p. 857, *segnis*, p. 858, *selecta*, p. 859, *alma*, p. 860, Winnertz, Verh. z.-b. Wien, xxi., S. Bavaria: spp. nn.

RHYPHIDÆ.

Rhyphus fenestralis. Perris (*l. c.* pp. 190–196, pl. 2. figs. 54–61) redescribes this species in all its stages, figuring details of the larva, and fully discussing its economy. He points out the very great similitude between the larvæ of *Rhyphus* and *Mycetobia*, evidently considering that these two genera should not be dissociated.

BIBIONIDÆ.

Bibio marci. Lucas, Ann. Soc. Ent. Fr. (5) i. Bull. p. lxxvii, describes the occurrence of large assemblages of its larvæ in a garden in Paris.

CHIRONOMIDÆ.

VON GRIMM, Mém. Pétersb. (7) xv. no. 8, translated in Ann. N. H. (4) viii. pp. 31–45, 106–115, pl. iii. figs. 1–12, describes and gives microscopical figures of details connected with the agamic reproduction in the pupa state of a species of *Chironomus*, and its development from the unfecundated egg.

BREE (Ent. v. p. 312) describes a "shower of insects" at Bath, which, from an editorial note, appear to be the larvæ of a *Chironomus*, possibly *C. plumosus*.

The larva of *Chironomus oceanicus*, Pack., is recorded from a depth of 20 fathoms in Eastport harbour, Maine, by Packard, in Am. J. Sci. (not seen by the Recorder), who identifies it with the supposed larva of *Micracalymma* referred to by himself in Am. Nat. ii. p. 278.

The larva and pupa of a *Tanypus*, or some closely allied genus, are described by Packard, *l. c.*; they were found abundantly in salt water, Clear Lake, California.

Ceratopogon. Porris (*l. c.* p. 138 *et seq.*) repudiates Bouché's reference of 4 joints to the antennæ of the larva of *C. lateralis*, as unlikely in any *Dipteron*; he describes, for the first time, the stigmata of a larva of this genus, having satisfied himself that these occur as follows:—one pair on the prothorax and one on each of the first 8 abdominal segments. From his observations, it appears that the larvæ of *Ceratopogon*, though partial to animalized matter, such as the "frass" of other larvæ, are sometimes carnivorous, devouring the larvæ and pupæ of other subcortical spp. of insects. After a general discussion of the recorded facts as to the larva of this genus, he expresses some doubt as to the correctness of the description &c. of that of *C. dufouri* by Laboulbène, and of *C. varius*, Winn., by Heeger.

Ceratopogon laboulbenii, sp. n., *id. l. c.* (larva, pupa, and imago) pl. 1. figs. 1–11, Landes.

CULICIDÆ.

Liégard, Mém. Soc. L. Norm. (2) iv. p. 92, under the name "*Culex*" *pungicus*, refers to the symptoms produced by gnats at Caen.

Culex pipiens. Hogg (M. Micr. J. vi. pp. 192–194, pl. ci.) describes and figures "battledore-scales," pointing out his own anticipation of Müller and

Delpino's supposed discovery. For account and figure of proboscis, &c., cf. Sci. Goss. 1871, pp. 108-110, fig. 65 (cf. also *ibid.* p. 62).

LIMNOBIIDÆ.

Polymera: Loew (Z. ges. Naturw. xxxvii. pp. 253-267, pl. v. figs. 1 & 2) recharacterizes and discusses the systematic position of this genus, figuring the wing &c.

STRATIOMYIDÆ.

The larvæ of an unknown *Stratiomys* found in salt water, Clear Lake, California, are described by Packard, *l. c.*

Pachygaster. Perris, *l. c.* p. 210, does not agree with Macquart or Dufour as to the larvæ in this genus, in which he has observed antennæ &c.; he thinks them closely allied to those of *Sargus*, and states that the brood is annual.

Pachygaster pini, sp. n., *id. l. c.* pp. 208-212, pl. 3. figs. 80-88, Landes.

XYLOPHAGIDÆ.

Xylophagus cinctus. Perris (*l. c.* pp. 202-207, pl. 3. figs. 70-79) redescribes this species in all its stages, figuring details of the larva and pupa. Chiefly from the structure of the larvæ, he considers that *Xylophagus* (a name which most likely conveys an incorrect idea) and *Subula* might well form types of distinct tribes or subtribes. The larva of *X. cinctus* was found in galleries of the larvæ of *Tomicus stenographus*; and, as in other cases, he considers it to feed on the excreta of the latter, and to be occasionally carnivorous.

TABANIDÆ.

Hæmatopota pluvialis. Perris (*l. c.* pp. 196-201, pl. 2. figs. 62-69) redescribes this species in all its stages, figuring details and discussing its economy. He has found the larva in the "frass" of *Hymenorus* and *Prionychus* (Col.) larvæ in rotten pine; but considers it is carnivorous from its structure, and mentions instances of larvæ of *Tabanidæ* observed by himself to devour larvæ of *Rhizotrogus*, *Homaloptia*, and *Melolontha vulgaris*.

Hæmatopota hieroglyphica, sp. n., Gerstücker, Arch. f. Nat. xxxvii. p. 362, Endara.

Tabanus terminalis, p. 255, Mt. Sinai, *nigrifer* and *politus*, p. 256, Hor Tamaniib, *pallescens*, p. 256, Tôr, Walker, Ent. v.: spp. nn.

Pangonia zonata, p. 256, *subfasciata*, p. 257, *id. l. c.*, Tajura: spp. nn.

THEREVIDÆ.

Thereva confinis, Fall. [= *Psilocephala ardea*, F.]. Perris (*l. c.* pp. 222-226, pl. 3. figs. 97-102) redescribes this species in all its stages, figuring, with details, the larva and pupa, of which the stigmata are pedunculated. He corrects an error of Westwood (Introduction, ii. p. 550), who attributes respiratory tubes to the apex of the larva of *T. plebeia*, and argues from their structure that the larvæ of species of this genus are carnivorous on occasion.

Thereva hebes, Loew, nec Walker, is renamed *pæcilopa*: Loew, Beschr. eur. Dip. ii (Berichtig.).

Thereva lutescens, sp. n., *id. l. c.* p. 196, Sarepta.

Psilocephala formosa, p. 198, *quadripunctata*, p. 202, Turkestan, *mendicula*, p. 200, Kultuk, *id. l. c.* : spp. nn.

SCENOPINIDÆ.

Scenopinus fenestralis. Perris (*l. c.* pp. 226-232, pl. 3. figs. 103 & 104) re-describes this species, figuring details of the larva and pupa, and noticing the apparently polyphagous habits of the former, which occurs in boleti attacked by other larvæ, in the hairs of furniture-stuffing, in swallows' nests, and in dead worm-eaten wood. He reviews the various positions assigned to the family, and, from the almost perfect affinity between the earlier stages of *S. fenestralis* and *Thereva confinis*, has no hesitation in considering that it must be placed next the *Therevidæ*.

ACROCERIDÆ.

Arrhynchus, g. n., Philippi, S. E. Z. xxxii. p. 291, taf. 3. f. 6-6a. Allied to *Panops*, but with 1 submarginal cell and 6 marginal, of which the 2nd is very narrow, and with the 2nd discoidal cell very long and narrow: also with no rostrum. *A. vittatus*, sp. n., *id. l. c.* p. 292, Curicó, Chili.

Thersites, g. n., *id. l. c.* p. 292. Allied to *Henops* and *Holops*, but with no discoidal cell, an incomplete marginal cell, and the antennæ situate on the underside of head. *T. jacobæus*, sp. n., *id. ibid.*, Santiago.

BOMBYLIIDÆ.

Dimorphophora, g. n., Walker, Ent. v. p. 272. *D. syrphoides*, sp. n., *id. ibid.*, Wady Genneh.

Exoprosopa gloriosa, *marginalis*, p. 260, *nigrifera*, *disrupta*, *antica*, *paupera*, p. 261, Egypt and Arabia, *id. l. c.*; *E. dedecor*, p. 204, *nubeculosa*, p. 205, Loew, *l. c.*, Turkestan: spp. nn.

Anthrax plagjata and *micrargyra*, Cairo, *subnotata*, Mt. Sinai, p. 262, *tenuis*, p. 271, Harkeko, Walker, *l. c.*; *A. stenurus*, p. 206 (? type of a new genus, *sec. auct.*), *subarcuatus*, p. 208, Loew, *l. c.*, Turkestan: spp. nn.

Cyllenia globiceps, sp. n., *id. l. c.* p. 220, Turkestan.

Amictus insignis, p. 209, *nobilis*, p. 211, *id. l. c.*, Turkestan: spp. nn.

Bombylius miscens, p. 271, *exiguus*, p. 272, Hor Tamanib, *nivifrons*, p. 271, Dahleck, Walker, *l. c.*: spp. nn.

Ploas adunca, p. 212, *luctuosa*, p. 214, Loew, *l. c.*, Turkestan: spp. nn.

NEMESTRINIDÆ.

Nemestrina ægyptiaca, Wied., ?=*reticulata*, Latr.: Walker, *l. c.* p. 260.

MYDASIDÆ.

Mydas [script. *Midas*] *maculatus*, sp. n., *id. l. c.* p. 272, Mt. Sinai.

ASILIDÆ.

Laphria gilva and *atra*. Perris (*l. c.* pp. 212-218, pl. 3. figs. 89-96, pp. 218-222) re-describes these spp. in all their stages, with figures in detail of the

larva and pupa of the former, which is parasitic upon the larvæ of *Spondylis buprestoides* and *Criocephalus rusticus* (Col.).

Laphria meridionalis. Perris (*l. c.* p. 219) corrects numerous errors in Mulsant's description of the larva; and remarks generally upon the fact that *Laphria* seems peculiarly parasitic upon the *Buprestidæ* and *Longicornia*.

Asilus. Perris (*l. c.* p. 220), recapitulating and correcting former descriptions of the larvæ of spp. of this genus, notes their carnivorous and other affinities to those of the *Tabanidæ*.

Damalis cinctipes, sp. n., Walker, *l. c.* p. 260, Hor Tamanib.

Dasygogon contrarius, sp. n., *id. l. c.* p. 257, Mt. Sinai.

Laphria nobilis, sp. n., *id. l. c.* p. 258, Rafla, Tajura.

Dasythrix dispar, sp. n., Gerstäcker, Arch. f. Nat. xxxvii. p. 362, Endara.

Promachus rapax, sp. n., *id. ibid.*, Endara.

Aleimus rubiginosus, sp. n., *id. ibid.*, Mbaramu.

Erax cinctipes, Wady Ferran, *cinicolor*, Harkeko: Walker, *l. c.* p. 258, spp. nn.

Asilus deformis, Wady Ferran, *mixatus*, Tajura, *enitens*, Wady Genneh, *id. l. c.* p. 259: spp. nn.

Tolmerus rucus, sp. n., Loew, *l. c.* p. 194, Smyrna.

Machinus lepturus, sp. n., Gerstäcker, *l. c.* p. 362, Endara.

EMPIDÆ.

Microphorus. Loew, *l. c.* p. 250, refers to the relationship between this genus and *Iteaphila*.

Synamphotera. Loew, *l. c.* p. 255, redescribes this genus, referring to his original description (*Z. ges. Naturw.* xi.) of *S. pallida*.

Empis longimana, p. 238, *subciliata*, p. 240, Kultuk, *id. l. c.*: spp. nn.

Rhamphomyia gentilis, p. 242, Sarepta, *tonsa*, p. 244, *insignis*, p. 240, Kultuk, *macrura*, p. 247, Irkutsk, *id. l. c.*: spp. nn.

Iteaphila maaeki, sp. n., *id. l. c.* p. 252, Kultuk.

Drapetis ænea, sp. n., Walker, *l. c.* p. 273, Cairo.

DOLICHOPODIDÆ.

Gymnopternus. Loew, *l. c.* p. 275, discusses the status of this genus, according to him (p. 278), *G. dysopes*, Gerst., = *inornatus*, Lw.

Medeterus ambiguus. Perris (*l. c.* pp. 321–326, pl. 4. figs. 105–111) redescribes this species in all its stages, figuring the larva and pupa, with details. He has observed the larva tearing and sucking the larvæ and pupæ of *Tomicus*.

Loew, *l. c.*, describes the following spp. nn.:—

Dolichopus perversus, p. 255, *breviusculus*, p. 269, Turkestan, *socer*, p. 257, Ochotsk, *spretus*, p. 259, Sweden, *montanus*, p. 261, Hartz [*phæopus*, Lw., olim, nec Hal., *sec.* Loew, *l. c.*; but *phæopus*, Hal. & Loew, are identical, *sec.* Verrall], *calinotus*, p. 264, Galizia, *salictorum*, p. 267, Silesia, *galeatus*, p. 271, Siberia.

Gymnopternus aberrans, p. 273, *clarus*, p. 276, Turkestan, *labiatus*, p. 280, Galatz, *rostellatus*, p. 281, Spain.

Tachytrechus petræus, p. 283, *sogdianus*, p. 286, Turkestan, *hamatus*, p. 284, Moscow.

Hercostomus pallidus, p. 288, *blepharopus*, p. 290, Turkestan.

Thinophilus pollinosus, p. 292, Turkestan.

Diaphorus deliquescentis, p. 293, Moscow.

Asyndetus albipalpus, p. 295, Turkestan.

Chrysotus nigricilius, p. 297, Turkestan.

Teuchophorus bisetus, p. 298, Turkestan.

Sympycnus speciosus, p. 299, Turkestan.

Medeterus lamprostomus, p. 303, Turkestan.

Psilopus gracilipes, p. 305, Tatra Mountains.

PHORIDÆ.

Phora pusilla. Perris (l. c. p. 354, pl. 5. figs. 162-170) redescribes this species in all its stages, figuring the larva and pupa, with details. The former appears to live on the "frass" of *Tomicus laricis*. In some general observations on the larvæ &c. of *Phora* (wherein he supplements Dufour's record of the cornuted stigmata of the pupa), the author asserts their carnivorous propensities.

Phora dimidiata, Meig., is a colour-var. of *thoracica*, Meig.; *flexuosa*, Egg., = *palpina*, Zett.; *pulicaria*, Fall., has occurred in a nest of *Vespa germanica* at Haarlem; and *palpina* and *zonata*, Zett., *abdominalis*, Fall., *maculata* and *opaca*, Meig., and *nigricornis*, Egg. (not ♂ of *opaca*), are recorded as new to the Dutch fauna, with dates and localities: v. d. Wulp, Tijdschr. Ent. (2) vi. pp. 209 et seq.

Phora sororcula, sp. n., *id. ibid.*, Amsterdam.

SYRPHIDÆ.

PERRIS (l. c. pp. 330-336), recapitulating the numerous accounts of the varied economy of the larvæ of certain species of this family, remarks that he has observed a larva, having great affinity to that of *Merodon*, living in stems of *Cirsium palustre*. He makes some interesting observations upon the earlier stages of *Xylota* and other genera, and details the act of the cornuted stigmata of the pupa of *X. pigra* being protruded through disks of the puparium.

Pelecocera trincta, Meig., *Didea alneti*, Fall., *Syrphus seleniticus*, Meig., *Melanostoma barbifrons*, Fall., *Chilosia longula*, Zett., *Helophilus frutetorum*, F., *Xylota abiens*, Meig., *X. florum*, F., *Orthoneura brevicornis*, Lw., are recorded as British by Verrall (Ent. M. M. vii. pp. 200-203), who also corroborates *Plocota apiformis* as British, and according to whom *Xylota florum*, Zett., and *X. bifasciata*, Meig., = *nemorum*, F.; *Eumerus litoralis*, Curt., = *sabulonum*, Fall.; *Pipiza vana*, Zett., = *noctiluca*, L., ♂, of which Malin is right in considering *carbonaria* and *stigmatica*, Zett., to be varieties; *Platychirus quadratus*, Mcq., = *scutatus*, Meig.; *P. dilatatus*, Mcq., = *peltatus*, Meig.; *Tropidia dorsalis*, Mcq., probably = *milesiformis*, Fall.

Corbin (Ent. v. p. 406) records an instance of *Eristalis tenax* living for certainly 40 hours with no abdomen.

Xylota pigra. Perris (l. c. pp. 326-330, pl. 4. figs. 112-124) redescribes this species in all its stages, figuring the larva and pupa with details. The larva lives with that of *Mycetobia pallipes*, under felled pine-bark, in galleries of *Tomicus stenographus* and *Astynomus cedilis*. The author contemplated de-

scribing this species as new, under the name *pini*, but attributes it to *pigra* in deference to the opinion of Winnertz,—pointing out, however, discrepancies between it and Meigen's description of *X. pigra*.

Pipiza noctiluca. Verrall notices a substance adhering to the head of an example of this species from Rannoch, either a fungoid growth or the pollen-mass of an orchid: Pr. E. Soc. 1871, p. x.

Eristalis punctifer, sp. n., Walker, l. c. p. 274, Tajura.

Syrphus fimbriatus, p. 222, Kultuk, *monochætus*, p. 224, Dalmatia, Loew, l. c.; *S. latiusculus*, p. 273, Wady Ferran, *interrumpens*, p. 273, and *turbidus*, p. 274, Cairo, Walker, l. c.: spp. nn.

Chilosia nebulosa, sp. n., Verrall, l. c. p. 201, England.

Platychirus discimanus, sp. n., Loew, l. c. p. 227, Bohemia.

Pyrophæna platygastera, sp. n., id. l. c. p. 229, Kultuk.

Chrysogaster tristis, sp. n., id. *ibid.*, Carinthia.

Orthoneura gonadesma, p. 231, *recurrens*, p. 232, Kultuk: id. l. c., spp. nn.

Mallota tricolor, sp. n., id. l. c. p. 234, Sarepta.

Criorrhina brevipila, sp. n., id. l. c. p. 235, Irkutsk.

Xylota sibirica, p. 236, Siberia, *pictipes*, p. 237, Archangel: id. l. c., spp. nn.

Plagiocera hæmorrhœa, sp. n., Gerstäcker, Arch. f. Nat. xxxvii. p. 363, Wanga.

CONOPIDÆ.

Conops aurata, sp. n., Walker, l. c. p. 339, Hor Tamanib.

MUSCIDÆ.

Cordylura pudica, Meig., *Lonchæa palposa* and *deutschi*, Zett., *Sapromyza anisodactyla* and *modesta*, Löw, *Palloptera arcuata*, F., *Trypeta serratulæ*, L., *Urophora cuspidata*, Meig., *Tephritis vespertina*, *proboscidea*, and *flavipennis*, Löw, *Platyparea discoidea*, F., *Spilographa meigeni*, Löw, *Mycetaulus bipunctatus*, Fall., *Madiza sordida*, Fall. (descr. p. 197, pl. 8. figs. 8 & 9), *Drosophila glabra*, Fall., *flaveola*, Meig., *confusus*, Staeg., *Asteia amœna*, Meig., *Leptomyza sordidella*, and *pallida*, Zett., *frontalis*, Fall., *Scyphella bipunctella* and *flavella*, Zett. (the latter questioned as properly referable to the genus), *Platycephala planifrons*, F., *Siphonella palposa*, Fall., *ænea*, Mq., *pumilionis*, Bjerk., *flavella*, Zett., *Meromyza nigriventris*, Mq., *Chlorops cingulata*, *notata*, and *circumdata*, Meig., *lineata*, F., *rufina*, Zett., *tarsata*, Fall., *Oscinis albiseta* and *fasciola*, Meig., *annulifera*, Zett., *bipunctata* and *dubia* (? = *longula*), Mq., *lineella* (with which *Chlorops hyalinipennis*, Meig., is synonym.) and *frontella*, Fall., *Agromyza cunctans*, Meig., *rusticornis*, Mq., *carbonaria*, Zett., *obscura*, Fall., *Phyllomyza securicornis*, Fall., *Phytomyza analis* and *crassiseta*, Zett., *albipennis* and *affinis*, Fall., *tridentata*, Löw, *zetterstedti*, Schin., *præcox* and *albiceps*, Meig., are recorded as new to the Dutch fauna, with dates and localities &c., by van der Wulp, Tijdschr. Ent. (2) vi. p. 186 *et seq.*

Phanides.

Apostrophus, g. n., Loew (Zool. Rec. vii. p. 436), l. c. p. 310. *A. anthophilus*, p. 310, Bavaria, *suspectus*, p. 312, Turkestan: spp. nn.

Tachinides.

Exorista leucania. For account of habits and figure of this parasite on *Eudryas grata*, cf. i. Rep. Ins. Ont. p. 100.

Larvæ of ? *Tachina* are recorded as found under shell of *Testudo græca* by Middleton, Sci. Goss. 1871, p. 41.

Echinomyia versuta, sp. n., Loew, l. c. p. 307, Irkutsk.

Tachina lasiommata, id. l. c. p. 309, Turkestan; *T. (Melanophora) diabroticæ*, Shimer, Am. Nat. v. p. 219, f. 60, U. S. A. (parasite on *Diabrotica vittata*); *T. (Masicera) archippivora*, parasitic upon *Danaïd archippus*, Riley, iii. Rep. Ins. Mo. p. 150 (only indicated): spp. nn.

Eurygaster leucomelas, p. 339, *incisus*, p. 340, Hor Tamanib, Walker, l. c., spp. nn.

Frontina latifascia, sp. n., id. l. c. p. 340, Wady Genneh.

Mitogramma minuscula, sp. n., id. l. c. p. 341, Tajura.

Gonia guttata, p. 341, *insueta*, p. 342, Tajura, id. l. c., spp. nn.

Sarcophagides.

? *Sarcophila guttata*, sp. n., id. l. c. p. 343, Tajura.

Muscides.

Rhynchomyia columbina. Perris, l. c. p. 340, reproducing Dufour's account of the economy of this species, considers that the larva has only 8 abdominal segments.

Anthomyides.

Anthomyia conformis, Fall. A larva mining leaves of beet-root is referred to this species by Fichtner in Verh. z.-b. Wien, xxi. p. 56.

Anthomyia brassicæ and *haberlandti*. Künstler, *ibid.*, Beih. pp. 38 & 19, discusses injuries to cultivated plants from these insects.

Hylemyia cæsia, Macq. Perris (l. c. p. 336) briefly redescribes this species in all its stages.

Anthomyia muscoides, sp. n., Walker, l. c. p. 344, Cairo.

Cordylurides.

Cleigastra nitida, sp. n., v. de Wulp, Tijdschr. Ent. (2) vi. p. 186, Breda.

Heteroneurides.

Heteroneura albinana, Meig. Perris (l. c. pp. 344-348, pl. 5. figs. 146-150) redescribes this species in all its stages, including the ♂, unknown to Meigen and Macquart, and figuring the larva (with details), which has the faculty of jumping, though no reason can be suggested for such a power in this case.

Ochthiphilides.

Leucopis griseola, Meig. Perris (l. c. pp. 348-352, pl. 5. figs. 151-155) redescribes this species in all its stages, figuring the larva and pupa with details. *Musca gibbosa*, Deg., is apparently to be referred to *Leucopis*, according to him.

Agromyzides.

Agromyza nigripes. Künstler, *l. c.* p. 58, discusses injuries to cultivated plants from this species.

Agromyza cunctans. The larva is found in thistles, and the imago appears in the month of May: v. d. Wulp, *l. c.* p. 205.

Agromyza ferruginosa, p. 205, pl. 8. f. 10, Haag, Rotterdam, *riparia*, *ibid.*, Haag, *discrepans*, p. 206, pl. 8. f. 11, Holland: *id. l. c.*, spp. nn.*

Napomyza piceipes and *nigriceps*, *id. l. c.* p. 207, Haag: spp. nn.

Ortali[di]des.

Anacampta (Loew, 1868, Z. ges. Naturwiss.), referred to in Zool. Rec. vii. p. 436, is to be here placed.

Herina strigulosa, sp. n., Walker, *l. c.* p. 345, Cairo.

Uliidiides.

Ulidia rufifrons, sp. n., *id. ibid.*, Cairo.

Sapromyzides.

Toxoneura fasciata. Perris (*l. c.* p. 337, pl. 4. figs. 125-129) redescribes this species in its chief stages. The larva (which is figured in detail) lives on the excreta of *Tomicus stenographus*.

Teremyia laticornis. Perris (*l. c.* p. 342, pl. 5. figs. 138-145) redescribes and figures (with detail) the larva of this species, briefly referring to the other stages of it. The larva appears to live in the "frass" of the larvæ of *Tomicus stenographus* and *T. luricis*, and sometimes to devour the latter.

Trypetides.

RONDANI (Bull. Ent. Ital. iii. pp. 1-24, 161-188), under the title of "Ortalidinae Italicae," completes his notice of the Italian *Trypetides*. He adopts *Acyntia*, Desv., as a subgenus of *Xyphosia*, regarding *corniculata*, Zett., as type of the first, and *miliaris*, Schr., of the 2nd; adopts *diotidis*, Duf., for *Tephritis stictica*, Lw., the insect living in *Diotis candidissima*; states that *T. conjuncta*, Lw., Zett., Schin., is confused with other species by all other authors, and describes 2 varr. of it, named *separata* and *divisa*; divides his own *Ditricha* into 3 subgenera, *Urellia*, Desv., a new subgenus, *Actinoptera* (p. 162), and *Ditricha* united to his own *Spathulina*; gives the name *Phagocarpus* to *Anomoja*, Wlk. (*Anomœa*, Lw.), preoccupied in *Coleoptera*; states that Waga's fig. of his *Adapsilia coarctata* in Ann. Soc. Ent. Fr. is quite wrong, and his description inexact; and gives the following synonymy:—*Xyphosia jaceæ*, Desv., = *corniculata*, Zett.; *X. flava*, Lw., *arnicæ*, Fall., *arcuata*, Fb., *cirsiorum*, Desv., and *meridionalis*, Costa, var., = *miliaria*, Schr.; *Tephritis eluta*, Meig., = *helianthi*, Rossi; *T. umbellatarum*, Rossi, = *hyoscyami*, L.; *T. postica*, Lw., = *heraclei*, Fab.; *T. confusa*, ? Meig., *pars*, *heraclei*, Deg., var., and *hyoscyami*, Fall., var., = *bardanæ*, Schr.; *T. dilacerata*, Lw., var., *hyoscyami*, Fall., var., *bardanæ*, Zett., *pars*, and *claripennis*, Desv., = *confusa*, Meig.; *T. flavicauda*, Meig., *arnicivora*, Lw., = *arnicæ*, L.; *T. gemmata*, Meig., = *guttata*, Fall.; *T. cometa*, Lw., = *radiata*, Fall.; *Ditricha radiata*, Schr., *terminata*, Fall., *nec* Meig., *calcitræ*, Desv., = *stellata*, Fuesl.; *D. amœna*, Frfld., = *parisiensis*, Desv.; *D. discoidea*, Fall., *gnaphali*, Frfld., = *æstiva*, Meig.; *D. filaginis*, Lw., = *terminata*, Meig.; *D. capitata*, Fall., = *guttular*,

Meig.; *Platyparea lychnidis*, Fall., = *discoidea*, F.; *Phagocarpus antica*, Wdm., *zetterstedti*, Boem., *gædi*, Meig., = *permundus*, Harr.; *Acyura femoralis*, Desv., *rotundiventris*, Meig., var., = *coryli*, Rossi; *A. gagates*, Lw., = *tibialis*, Desv.; *Philophylla heraclei*, Lw., = *onopordi*, F.; *P. heraclei*, var., Lw., = *centaureæ*, F.; *Acydia speciosa*, Lw., *cognata*, Meig., pt., = *lucida*, Fall.; *A. lychnidis*, F., *centaureæ*, Fall., *discoidea*, Meig., = *cæsis*, Harr.; *Mosina zetterstedti*, Fall., = *connexa*, F.

Platyparea pæcioptera and *Spilographa cerasi*. Künstler, l. c. pp. 55 & 83, discusses injuries to cultivated plants from these species.

Curphotricha pupillata is recorded as bred from larvæ found in *Hieracium umbellatum*: v. d. Wulp, l. c. p. 188.

Ceratitis. Laboulbène, Ann. Soc. Ent. Fr. (5) i. pp. 439-443, identifies an Algerian species as *C. hispanica*, de Brême (of which he publishes a description by Bigot of the ♂). Löw has erroneously attributed this to *capitata*, Wied., an Azorean species, with which *citriperda*, MacL., is synonymous; and the Bourbon species is *C. catoirii*, Guér., erroneously confused by Macleay with *citriperda*. The Algerian species appears to produce a gall in the peel of the orange in which the ♀ has deposited her egg; the injury does not appear to extend beyond the peel, yet the fruit drops from its tree. Catoire's opinion that the ♀ deposits her egg in orange-blossoms appears incorrect.

Philophylla, g. n., Rondani, l. c. p. 175 (*Acydia*, Lw., Schin., pt.). Types *P. onopordi* and *centaureæ*, F. [at variance with analytical table, cf. Zool. Rec. vii. p. 441].

Tephritis decipiens, p. 16, Tuscany, Parmese Apennines (*conjuncta*, var. ♂, Lw.), *rufina*, p. 17, Piedmont, *sejuncta*, p. 18, Italy, *obscuricornis*, p. 21, Sicily, *matutina*, p. 22, Apennines and Sicily: *id. l. c.*, spp. nn.

Ditricha helichrysi, sp. n., *id. l. c.* p. 165, Piedmont.

Dacides.

Dacus sex-maculatus, sp. n., Walker, l. c. p. 344, Harkeko.

Sepsides.

Madiza annulitarsis, Zett., is ♀ of *M. (Agromyza) latipes*, Meig., according to v. d. Wulp (l. c. p. 195), who redescribes and figures both sexes, with details, pl. 8. figs. 2-7.

Sepsis pilipes, sp. n., *id. l. c.* p. 189, pl. 8. f. 1, Amsterdam and Utrecht.

Nem[at]opoda umbripennis, *id. l. c.* p. 190, Amsterdam (? = *fumipennis*, Walk., sec. auct.); *N. varipes*, Walker, l. c. p. 345, Cairo: spp. nn.

Themira consobrina, sp. n., v. d. Wulp, l. c. p. 192 (*T. minor*, Schiner, v. d. Wulp, olim, nec Hal.).

Madiza griseola, sp. n., *id. l. c.* p. 198, Scheveningen.

Psilides.

Psila rosæ. Künstler, Verh. z.-b. Wien, xxi. Beih. p. 52, discusses injuries to cultivated plants from this species.

Chloropides.

Chlorops strigula and *Oscinis frit*. Injuries to cultivated plants from these species discussed, *id. l. c.* pp. 19 & 17.

Chlorops tæniopa, Meig. Max Nowicki, *ibid.* p. 58, gives a detailed account of the economy of this fly, which has occurred in such numbers in parts of Central and Eastern Europe as to have become a veritable plague, destroying wheat-plants. Means of repressing its ravages are indicated.

Chlorops lineata. Jenyns (*hodie* Blomefield), Pr. E. Soc. 1871, p. x, remarks that similar swarms of this species to those mentioned, *ibid.* 1870, p. xxxiv, were recorded by him 39 years before as occurring in the same house.

Oscinis pusilla, Meig. Perris (*l. c.* p. 352, pl. 5. figs. 156-161) redescribes this species in all its stages, figuring in detail the larvæ, which appears to live at the expense of the larvæ of various wood-feeding beetles.

Siphonella nucis, Perris. Laboulbène, Ann. Soc. Ent. Fr. (5) i. p. 294 *et seq.*, corroborates Perris's remarks on the economy of this species.

Chlorops sulcata, sp. n., v. d. Wulp, *l. c.* p. 201, Haag sand-hills.

Oscinis rufescens, sp. n., Walker, *l. c.* p. 345, Cairo.

Helomyzides.

Blephariptera serrata. Perris (*l. c.* p. 341, pl. 4. figs. 130-137) describes and figures the larvæ and pupa of this species, which is apparently closely allied to *Toxoneura*. He has found the larvæ in the nest of *Cnethocampa pityocampa*, on the excreta of the larvæ of which they feed.

Ephydrides.

The puparia of *Ephydra* are eaten by Indians about Mono Lake, California: Packard, *l. c.*

Ephydra californica, Clear Lake, California, and *gracilis*, Great Salt Lake (both named from larvæ and pupa only), Packard, *l. c.* : spp. nn.

CESTRIDÆ.

Gastrus equi. Laboulbène notes the rarity in the perfect state of this species, which he has bred from a pupa found in horse-droppings: Ann. Soc. Ent. Fr. (5) i. Bull. p. lxiii.

HIPPOBOSCIDÆ.

Anapera pallida. Lucas (*ibid.* p. xxiii) refers to this species a pupiparous fly found by Fallou on *Cypselus apus* in Paris (15 or 20 on each bird), during the recent siege.

Lipoptena dubia, sp. n., Rudow, Z. ges. Naturw. xxxvii. p. 122, on *Noctilio dorsatus*, from Venezuela.

NYCTERIBIIDÆ.

Nycteribia elongata, *ibid.*, on *Nyctophilus geoffroyi*; *varipes*, p. 123, on *Miniopterus morio*: *id.* *l. c.*, spp. nn.

STREBLIDÆ.

Strebla longipes, sp. n., *id.* *l. c.* p. 121, on *Phyllostoma hastatum*.

(APHANIPTERA.)

PULICIDÆ.

Pulex irritans. Furlonge (Journ. Quek. Micr. Club, 1871, pp. 189-203) gives an extremely detailed account of its external anatomy. For general observations, cf. Cutting, Arch. Tr. Orl. Soc. i. p. 105.

Pulex canis, *talpæ*, *vespertilionis*, *sciurorum*, ? *hirundinis*, and *penetrans*. For highly magnified figures and popular account, cf. Sci. Goss. 1871, pp. 97-101, figs. 56-61; also pp. 156 & 157, fig. 75, for description and figures of mouth-organs of *Pulex*.

PLATYPSYLLIDÆ.

Platypsyllus castoris. Lucas, Ann. Soc. Ent. Fr. (5) i. Bull. p. lxxix, briefly refers to its analogies.

NEUROPTERA

By R. M'LACHLAN, F.L.S., Sec. Ent. Soc.

OULIANINE, B. (List of *Neuroptera* and *Orthoptera* of the environs of Moscow.) Nachr. Ges. Mosc. vi. pt. 2 (1869), pp. 1-119.

Printed in the Russian language. 160 spp. of *Neuroptera* (in the Linnæan sense) and 51 of *Orthoptera* are enumerated. There are also descriptions of some apparently new but unnamed species.

PACKARD, A. S., Jr. Embryological Studies on *Diplax*, *Perithemis*, and the Thysanurous genus *Isotoma*. Mem. Peab. Ac. i. (No. 2), pp. 1-21, pls. i.-iii.

A list of species taken at Baraque Michel, Belgium, is given in Ann. Ent. Belg. xiv. c.-r. p. lxi.

DIETRICH, Ent. Bl. i. pp. 2-7, 18, has a list of species of various groups observed by him in the Canton Zurich.

TRICHOPTERA.

The Recorder has published (P. L. S. xi. pp. 98-141, pls. ii.-iv.) a paper "On new forms, &c. of extra-European Trichopterous Insects," which he prefaces (pp. 98-101) by some remarks on their position in the system, especially with regard to Packard's view of them as comparatively degraded forms of the order *Neuroptera* (which he retains nearly in the Linnæan sense), and expressing an opinion that they probably form a separate order, manifesting considerable affinity with the *Lepidoptera*, and but little, if any,

with the pseudo-Neuropterous division. Packard (Am. Nat. v. pp. 707-713) maintains the homogeneity of the order *Neuroptera* as treated by him, especially basing his opinion on what he conceives to be a similarity of embryological development in *Libellula* and *Chrysopa*, and considering the enormous gaps existing between the various groups to be due to extinction of genera in palæozoic and mesozoic times. The Recorder takes this opportunity of remarking that, according to his views, embryology alone is not sufficient to decide the question in dispute, and that geological evidence sufficient to support Packard's theory is not yet forthcoming.

P. DE BORRE, Ann. Ent. Belg. xiv. pp. 62-71, describes a collection of the cases of *Trichoptera* from Bavaria received from Dr. Walser.

M'LACHLAN, Ent. M. M. vii. p. 281, notices Wallengren's identifications of the types of various species of this division described by Zetterstedt in his 'Insecta Lapponica' (cf. Zool. Rec. vii. p. 445).

Phryganeidæ.

For a synonymic list of the described species, with remarks on the generic characters, cf. *id.* P. L. S. xi. pp. 101-106.

Agrypnia pagetana captured at Edinburgh: Wormald, Ent. M. M. viii. p. 137.

Phryganea sordida, sp. n., M'Lachlan, l. c. p. 106, Japan.

Holostomis melaleuca, sp. n., *id. ibid.*, Japan.

Limnophilidæ.

Phacopteryx brevipennis recorded from Ranworth Fen, Norfolk: *id.* Ent. M. M. viii. p. 139.

Platyphylax, g. n., *id.* P. L. S. xi. p. 109. Allied to *Stenophylax*, but with only 1, 2, 2 spurs. *Enæcylla frauenfeldi*, Brauer, and *P. lanuginosus*, sp. n., *id.* l. c. p. 110, Shanghai.

Neophylax, g. n., *id.* l. c. p. 111. Spurs 1, 2, 4; anterior wings densely pubescent, the apical margin sinuate; posterior wings with only 5 apical cells; abdomen of the ♂ with two teeth beneath. *N. concinnus*, sp. n., *id. ibid.* pl. ii. fig. 3, N. America.

Grammataulius brevilinea, sp. n., *id.* l. c. p. 107, Japan.

Stenophylax gentilis and *limbatus* (pl. ii. fig. 2), *id.* l. c. p. 108, New Hampshire: spp. nn.

Sericostomatidæ.

Nosopus, g. n., *id.* l. c. p. 114. Allied to *Mormonia*: ♂, spurs 1, 4, 4; maxillary palpi small and applied against the face, labial palpi very large, dilated, and furnished with scales; anterior legs with the tibia very short; 1st joint of tarsi enormously dilated, and furnished beneath with waxy scales. *N. podager*, sp. n., *id.* l. c. p. 116, pl. ii. fig. 6, California.

Dinarthrum, g. n., *id.* l. c. p. 116. Allied to *Mormonia*: ♂, spurs 2, 4, 4; antennæ with basal joint as long as the body, compressed, very hairy, and furnished with a spine; maxillary palpi long and porrect, 2-jointed?; anterior

wings with a long median longitudinal pouch, clothed with scales. *D. ferox*, sp. n., *id. l. c.* p. 118, pl. ii. fig. 7, N. India.

Notidobia griseola, p. 112, pl. ii. fig. 4, and *nigricula*, p. 113, fig. 5, *id. l. c.*, California : spp. nn.

Leptoceridae.

Pseudonema obsoletum, M'L., = *Tetracentron sarothropus*, Brauer; and the former genus, characterized from a mutilated example, is sunk in favour of the latter : *id. l. c.* p. 128.

Ascalaphomerus is recharacterized, and details of *A. finitimus* figured, pl. iii. fig. 9 : *id. l. c.* p. 121.

Hydropsyche vicaria, Walk., is redescribed and referred to *Ganonema* : *id. l. c.* pp. 126 & 127.

Setodes interrupta. Thevenet, Ann. Soc. Ent. Fr. (5) i. pp. 371-373, pl. v. figs. 1-6, gives an account of the case and larva, the former being of a semipellucid texture, without admixture of sand. He describes and figures the various stages, and, thinking the species to be new, applies to it the provisional name *Mystacida trifasciata*.

Ganonema molliculum, sp. n., *id. l. c.* p. 127, pl. iii. fig. 12, Venezuela.

Setodes argentifera, sp. n., *id. l. c.* p. 129, fig. 13, N.W. India.

Perissoneura, g. n., M'Lachlan, *l. c.* p. 119. ♀, spurs 2, 4, 4; abdomen robust; wings broad, the anterior pair with the radius confluent with the 1st apical sector; discoidal cell with a supplemental transverse nervule; costal area with several strong transverse nervules, one of which is forked; maxillary palpi long, ascending, stout. *P. paradoxa*, sp. n., *id. l. c.* p. 120, pl. iii. fig. 8, Japan.

Heteroplectron, g. n., *id. l. c.* p. 123. Spurs ♂ 2, 4, 2, ♀ 2, 4, 4; tibiae of the ♂ with long fringe; wings broad, the superior pair elongately triangular, densely pubescent; neuration alike in both sexes; posterior wings having the radius confluent with the first sector. *H. californicum*, sp. n., *id. l. c.* p. 125, pl. iii. fig. 10, California.

Hydropsychidae.

Stenopsyche griseipennis. ♀ new to science : *id. l. c.* p. 134.

Plectrocnemia. 3 spp. occur in Europe, viz. *P. conspersa*, Curt., and 2 spp. nn., and their anal appendages are figured : *id. Ent. M. M.* viii. pp. 143-146.

Xiphocentron[-rum], g. n., Brauer, Verh. z.-b. Wien, xxi. p. 104. Allied to *Nesopsyche* : spurs 2, 4, 3 (4), the apical spurs of the hinder tibiae united into a long, flattened, sword-shaped plate; anterior wings with the apical forks 1, 2, and 4 present; posterior wings with only fork 5 present; no ocelli; 4th joint of maxillary palpi and 2nd of labial very long. *X. bilitmekii*, sp. n., *id. ibid.* pl. ii. Mexico.

Smicridea, g. n., M'Lachlan, P. L. S. xi. p. 134. Spurs 1, 4, 4; antennae short, slender; ocelli absent; tibiae of ♀ slightly dilated; anterior wings elongate, dilated towards the obtusely oblique apex, apical cells 1-5 present; posterior wings broader, cells 2, 3, and 5 present, radius confluent with the first apical sector. *S. fasciatella*, p. 136, pl. iv. fig. 19, Texas, *saucia*, fig. 20, Peru, and *murina*, fig. 21, Chili, p. 137 : *id. l. c.*, spp. nn.

Plectrocnemia geniculata, Switzerland and England, and *brevis*, Switzerland, *id.* Ent. M. M. viii. pp. 143-146, spp. nn.

Macronema polygrammatum, p. 129, pl. iii. fig. 14, N. America; *digramma*, p. 131, pl. iv. fig. 15, Minas Geraes: *id.* P. L. S. xi., spp. nn.

Hydropsyche colonica, p. 131, pl. iv. fig. 16, New Zealand, *mauritiana*, fig. 17, Mauritius, and *modica*, fig. 18, Australia, p. 133: *id.* l. c., spp. nn.

Tinodes consueti, sp. n., *id.* l. c. p. 138, pl. iv. fig. 22, California.

Rhyacophilidæ.

Agapetus celatus, sp. n., *id.* l. c. p. 139, pl. iv. fig. 23, California.

NEUROPTERA PLANIPENNIA.

WALLENGREN, Sv. Ak. Handl. ix. (No. 8) pp. 1-76, in the 1st part of his 'Skandinavien Neuroptera' (reviewed Ent. M. M. viii. p. 188), publishes a most carefully elaborated monograph of the Scandinavian species of this division, 52 in number (of which 2 are new), distributed as follows:—*Myrmeleonidæ* 1, *Hemerobiidæ* 39, *Coniopterygidæ* 2, *Sialidæ* 6, *Panorpidæ* 4.

BRÄUER (Verh. z.-b. Wien, xxi. pp. 107-116) publishes some observations upon the metamorphoses and economy of certain species of this division.

Sialidæ.

Sialis fuliginosa occurs in the lake-districts of England (M'Lachlan, Ent. M. M. viii. p. 39) and at Braemar (F. B. White, *ibid.* p. 65).

Ascalaphidæ.

The Recorder (P. L. S. xi. pp. 219-276) has published "An attempt towards a systematic classification of the family *Ascalaphidæ*," prefaced by remarks on habits, geographical distribution, &c. He divides the group into 27 genera, of which many are new, and remodels the arrangement proposed previously by Hagen, especially as regards Lefebvre's sectional partitions proposed in 1842.

Haploglenius (Burm.) is retained for Burmeister's typical species and many others, distinguished especially by the prothoracic valve of the ♂, and the wings being expanded horizontally in repose. *Phynx* (Lefebv.) includes *appendiculatus*, Fab., and a new species. *Cordulecerus* (Ramb.) includes *surinamensis*, Fab., *vulpecula*, Burm., and others. *Uthla* and *Colobopterus* (Ramb.) are retained as limited by their author, with the additional species since described. *Orphne* (Lefebv.) includes *impavida*, Walk., and *macrocerca*, Burm. *Suphalasca* (Lefebv.) is restricted to the Australian *flavipes*, Leach, and allies, but in it are grouped provisionally several species of uncertain position. *Bubo* (Ramb.) and *Theleproctophylla* (Lefebv.) remain as defined by their authors. *Oncogaster* (Westw.) contains *tessellata* and *segmentator*, Westw. *Acheron* (Lefebv.) is limited to *longus*, Walk., with which are grouped several others of Walker's species as conditions or sexual forms. *Hybris* (Lefebv.) includes *javana*, Burm., and allies. *Proctarrelabis** (Lefebv.)

* [Agassiz quotes this word as of doubtful meaning; but Lefebvre appa- 1871. [VOL. VIII.]

is restricted to *annulicornis*, Burm., and allies. *Puer* remains as intended by Lefebvre. *Ascalaphus* is restricted to the well-known black and yellow European forms. In all about 103 species are noticed. The following are the new genera and species:—

Cormodes. Eyes simple; wings elongate, not appendiculate; antennæ robust; abdomen of ♂ without appendices. Type *Ascalaphus intractabilis*, Walk.

Idricerus. Allied to *Cormodes*, differing in its narrower wings, whereof the anterior pair are shallowly excised at base of inner margin. Type *A. decrepitus*, Walk.

Melambrotus. Eyes simple; wings long, very narrow, anterior pair appendiculate; antennæ short and stout, only about half the length of the wings; abdomen without appendices in ♂; legs short. Type *M. sinia*, sp. n., p. 241, Damara Land.

Tmesibasis, proposed for *A. laceratus*, Hag., whereof the characters are pointed out in the original description.

Aemonotus. Eyes divided, divisions nearly equal; wings very narrow, not appendiculate; antennæ short; abdomen of ♂ with a pair of short appendices, and an enormous conical hump above at its base. Type *A. incudifer*, sp. n., p. 253, W. Australia.

Siphlocerus. Eyes with lower division much smaller than the upper; wings narrow, not appendiculate; antennæ short, those of ♂ twisted and suberrate in the apical half; abdomen of ♂ with a pair of short forcipate appendages. Type *A. nimius*, Walk.

Helicomitus. Allied to *Bubo* and *Siphlocerus*, but in the ♂ the antennæ are irregularly sinuous in the basal half, and the abdomen is without appendages. Type: *A. insimulans*, Walk.

Encyoposis. Eyes very large, the upper division more than twice the size of the lower; wings moderately broad, not appendiculate; antennæ shorter than wings; abdomen of ♂ very stout, constricted at base, and with a pair of large forcipate appendages. Type *A. flavilinea*, Walk.

Glyptobasis. Allied to *Hybris*, but anterior wings narrowed and appendiculate at base; abdomen of ♂ with a pair of short claw-shaped appendages. Type *A. dentifer*, Westw.

Nephoneura. Allied to *Proctarrelabis*. Anterior wings appendiculate. Type *A. capensis*, Fab.

Helcopteryx. Allied to *Proctarrelabis*. 3 terminal segments of abdomen of ♂ with a wing-like lateral dilatation; appendages of ♂ small and claw-shaped. Type *Bubo rhodiogrammus*, Ramb.

Ascalaphodes. Allied to *Puer*. ♂ with antennæ serrate internally, and a pair of short stout appendages to abdomen. Type *A. canifrons*, Westw.

Haplogleivus flavicornis, Mexico, *terminalis*, Tapajos, p. 235.

Ptynx juvenilis, p. 239, Texas.

Ula mexicana, p. 248, Mexico; *ampla*, St. Domingo; *aurifera*, p. 249, Santarem.

Colobopterus delicatulus, p. 250, Santarem; *integer*, p. 251, Brazil?; *disimilis*, Amazons.

rently intended to write *Proctarhenolabis*, a sesquipedian name referring to the forcipate abdomen of the male. Cf. the same author's *Deleproctophylla* (= *Thelyproctophylla*), referring to an analogous structure in the female.—E. C. R.]

Suphalasca wilsoni, p. 255, *difformis*, p. 257, S. Australia; *inconspicua*, p. 256, Victoria; *magna*, Champion Bay; ? *malayana*, Celebes; ? *caldoni*, p. 258, New Caledonia; ? *cephalotes*, Madagascar; ? *abdominalis*, Gaboon; *africana*, p. 259, Gaboon and Madagascar.

Encyoposis amicus, p. 263, Natal; ? *longistigma*, White Nile.

Nephoneura collusor, p. 269, Cape.

Ascalaphus syriacus, p. 274, Syria.

Cordulecerus. De Selys-Longchamps (Ann. Ent. Belg. xiv. c.-r. p. xxxi) publishes synonymic notes, and proposes the name *maclachlani* for the species figured by Rambur as *surinamensis*.

Myrmeleonidæ.

Myrmeleon formicarius, *formicaleo*, and *formicalynx*. McLACHLAN, Tr. E. S. 1871, pp. 441-444, and Pr. p. xlvii, enters into a discussion as to the correct application of those Linnæan names. He follows the Swedish authors in reserving *formicarius* for the species known by modern authors as *formicalynx*; *formicaleo* of the 10th edition of the Syst. Naturæ he applies to the common species with spotted wings, almost universally known as *formicarius*; *formicalynx* he considers to be represented by some, now undeterminable, African species. (Cf. Wallengren, l. c.)

M. immaculatus. Popular account of habits, with figures: Emerton, Am. Nat. iv. p. 705.

Hemerobiidæ.

Micromus variegatus. Brauer, Verh. z.-b. Wien, xxi. p. 107, pl. ii. fig. 2, describes and figures the larva bred from the egg.

Hemerobius orotypus, sp. n., Wallengren, l. c. p. 41, Sweden and Lapland.

Chrysopidæ.

PACKARD, Am. Nat. v. pp. 564-568, details his observations upon the embryological development of *Chrysopa*, in relation to its bearings upon the classification of the *Neuroptera*. He states that the embryogeny of this insect is identical with that of the *Libellulidæ*, and considers this a proof that there is no ordinal discrepancy between the *Pseudo-Neuroptera* and *Neuroptera Planipennia*. He concludes his paper by general remarks on the development of the *Articulata*.

Coniopterygidæ.

Coniopteryx lutea, sp. n., Wallengren, l. c. p. 55, Sweden.

Panorpidæ.

Panorpa. Brauer, l. c. p. 109, continues his observations on the larvæ of European species. He has found many larvæ among ants, under moss on the stump of an old tree.

Bittacus hageni and *italicus*. Larvæ described and figured, with additional information concerning the latter species. The eggs often remain two years before hatching: *id.* l. c. pp. 109-116, pls. ii. & iii.

Boreus. A species as yet undescribed, and twice the size of the described European forms, is recorded from the Hartz: *id.* Bericht Entom. 1869 (1871), p. 56.

Bittacus apterus, sp. n., McLachlan, Ent. M. M. viii. p. 100 (figure), California.

PSEUDO-NEUROPTERA.

THYSANURA (see Zool. Rec. vii. p. 446, note).

TULLBERG, in his "Förteckning öfver Svenska Podurider" (Elev. Vet. Ak. xxviii. pp. 143-155), enumerates 66 species of Swedish *Podurika*, including the two following genera (subfam. *Lipurinae*) and 30 species, treated as new:—

Triæna, p. 155. No postantennal organs, 16 ocelli, no inferior unguiculus; fork very small, with papilliform teeth; 3 anal spines. Type *T. mirabilis*, sp. n.

Pseudachorutes, *ibid.* Body moderately stout, not tuberculate; mouth-organs suctorial; 16 ocelli; no inferior unguiculus; fork small, not pertaining to the ventral tube; no anal spines. Type *P. subcrassus*, sp. n.

Sminthurus 9-lineatus, *flaviceps*, *pruinosis*, *albifrons*, *bimaculatus*, *cinctus*, p. 145, 4-lineatus and *cæcus*, p. 146.

Papirius silvaticus and *flavosignatus*, p. 146.

Orchesella spectabilis, p. 147.

Degeeria marginata, *arborea*, p. 148, *cyanea*, p. 149.

Macrotoma vulgaris, *flavescens*, and *rufescens*, p. 149.

Lepidocyrtus cyaneus, p. 150.

Isotoma olivacea, *maritima*, p. 151, *crassicauda*, 6-oculata, 4-oculata, 4-denticulata, *minuta*, and *alba*, p. 152.

Achorutes inermis, p. 153.

Xenylla nitida, p. 154.

Lepisma saccharina. In Proc. E. S. 1871, p. xiv, are some remarks on damage occasioned to books, silk fabrics, &c., by this species. Lucas, Ann. Soc. Ent. Fr. (5) i. Bull. p. xxiv, attributes this to the presence of starch in the articles attacked.

PACKARD, Am. Nat. v. pp. 91-107, pl. i., under the title "Bristle-tails and Spring-tails," gives an interesting and well-illustrated sketch of this group.

Isotoma. For observations on the development of an apparently undescribed N. American species, named *walkeri*, cf. *id.* Mem. Peab. Ac. ii. pt. 2, pp. 15-21.

Podura. Wenham, M. Micr. J. vi. pp. 6 & 7, details the results of an investigation of the structure of the scales, and maintains the existence of longitudinal ribs.

MALLOPHAGA.

Docophorus. Piaget (Tijdschr. Ent. 1871, pp. 113-137, pls. vi. & vii.) describes and figures 14 species, of which *icterodes*, Nitzsch, *platysomus*, Burm., *cephalus*, *limosæ*, and *lari*, Denny, are known species.

Trichodectes. Giebel (Z. ges. Naturw. xxxvii. pp. 173-177) gives a list of the *Mammalia* on which the known species are parasitic.

Menopon ptilorhynchi, sp. n., Ponton, M. Micr. J. vi. p. 8, pl. xci. fig. 1 (on *Ptilorhynchus holosericeus*).

Nirmus nitzschi, sp. n., *id.* *ibid.* fig. 2 (on *P. holosericeus*).

Docophorus depressus, p. 115, pl. vi. fig. 1 (on *Malaconotus icterus*), *lati-clypeatus*, p. 116, fig. 2 (on *Cuculus flabelliformis*), *forficula*, p. 117, fig. 3 (on different species of *Platyccrus*), *protrusus*, p. 119, fig. 4 (on *Eclectus sinensis* and *puniceus*), *gracilis*, p. 120, fig. 5 (on *Xulla mangola*), *obcordatus*, p. 121, fig. 6 (on *Scythrops novæ-hollandiæ*), *platyclypeatus*, p. 152, pl. vii. fig. 12 (on *Anastomus lamelligerus*), *hirundinis*, fig. 13 (on *Hirundo rustica* and *urbica*), and *emarginatus*, fig. 14 (on *Ibis peregrina* and *religiosa*), p. 153, Piaget, l. c.; *D. denii*, Ponton, l. c. fig. 3 (on *Prismiles mexicanus*): spp. nn.

Trichodectes leporis, sp. n., Ponton, l. c. fig. 4 (on *Lepus cannabinus*).

TERMITIDÆ.

In Am. Nat. v. p. 171, is a note by T. Fetnam regarding the damage occasioned by a species of white ant occurring in St. Helena, most probably *Termes tenuis*, Hagen, as the Recorder has received that species thence in large numbers.

EPHEMERIDÆ.

EATON (Tr. E. S. 1871, pp. 1-164, pls. i.-vi.) has completed the first part of "A Monograph on the Ephemeridæ," comprising the bibliography, nomenclature, and systematic portion of the work (reviewed Am. Nat. v. p. 417). His treatment of this most difficult family is at once masterly and exhaustive, and embraces fossil as well as recent species. He passes some severe strictures upon the "random guesses" of palæontologists who profess to name and describe new forms from mere fragments of impressions of wings, and gives valuable instructions as to the best means of preserving and studying these insects. He arranges the species under 26 genera, and describes about 178 recent species, exclusive of some scarcely determinable.

Eaton describes the following new genera and species:—

Asthenopus, p. 59. Allied to *Campsurus*, but terminal margin of anterior wing here and there with transverse veinlets. *Palingenia dorsalis*, Burm., and *A. curtus*, p. 59, Pará.

Euthyplocia, p. 67. Allied to *Pentagenia*, but cross veinlets crowded. Type *Palingenia hecuba*, Hag.

Cronicus, p. 133. Allied to *Heptagenia*; appendages of ♂ 4-jointed; middle caudal seta very short. Type *Bætis anomala*, Pict. (fossil in amber).

Isonychia, p. 134. Allied to *Bætisca*; cross veinlets regular and well defined. *Bætis ignota*, Walker, and *I. manca*, *ibid.*, Texas.

Campsurus cuspidatus, p. 58, Guatemala; *quadridentatus*, Santarem. *Poly-mitarceys savignii*, p. 61, Nile. *Ephemerella immaculata*, p. 74, Hindostan; *serica*, p. 75, N. China. *Leptophlebia furcifera*, p. 79, Melbourne; *inconspicua*, Adelaide; *dentata*, p. 80, New Zealand; *strigata*, N. Australia; *nodularis*, p. 81, New Zealand; *auriculata*, p. 83, Graham's Town; *mollis*, p. 88, New York. *Centropitum stenopteryx*, p. 110, Carinthia. *Bætis finitimus*, p. 113, Val Montjoie; *amnicus*, p. 117, Barberine; *pictus*, p. 122, Texas. *Siphilurus linnaeanus*, p. 127, locality unknown. *Coloburus haleuticus*, p. 133, Melbourne. *Heptagenia nivata*, p. 137, Barberine; *borcalis*, Finmark; *cupulata*, p. 138, N. China; *alpicola*, p. 148, Val Montjoie and Carinthia.

ÉMILE JOLY has published a series of 'Contributions pour servir à l'histoire naturelle des Ephémérides' (No. 1, Bull. Ac. Hist. Nat. Toulouse, iv. p. 142 *et seq.*, pl. iii.; Nos. 2 & 3, Mém. Soc. Cherb. xvi. pl. i.), of which the Recorder has seen only separate copies. In No. 1 he traces the development of *Cenis grisea*, and of what he considers to be a new species, described as *C. maxima*, from the Garonne, of which he figures the nymph. In No. 2 he separates from *Palingenia longicauda* an insect from Toulouse, described by him under the name *P. rœseli*, as a new species, but which he nevertheless states may be only a variety. Figures of the nymph accompany the paper. In No. 3 he records the occurrence in the Garonne at Toulouse, in September, of several individuals of the creature first noticed by Geoffroy as the "Binocle à queue en plumet," which Latreille subsequently placed in his genus *Prosopistoma* among the *Crustacea*. He is of opinion that it is the larva of an aquatic insect, and belongs to the *Ephemeride*, although it has no free external respiratory plates.

Palingenia virgo. N. JOLY, in a paper, "Sur l'hypermétamorphose de la *Palingenia virgo* à l'état de larve; analogies de cette larve avec les Crustacés," in Mém. Soc. Toulouse (7) iii. pp. 379-386, plate [cf. C. R. lxxiii. p. 276, and Ann. Sc. Nat. (5) xv. art. 10, pp. 1-5], traces the development of this species from the egg, and affirms that, at the moment the larva is hatched, it has no visible nervous system, no circulatory apparatus, and no special respiratory organs; the antennæ and tails have a less number of joints than in the more developed larva. He considers that it undergoes a hypermetamorphosis, and that there is a singular analogy between its development and that of certain *Crustacea*.

Lucas, Ann. Soc. Ent. Fr. (5) i. Bull. p. xliii, gives a specimen of "newspaper entomology," in the form of an extract from the 'Paris Journal,' in which the sudden appearance of this insect in swarms, termed by the writer "une trombe de papillons," is referred to the precipitate burials during the disturbances at Paris.

S. J. SMITH, Am. J. Sc. 1871, p. 44, gives a "Notice of a fossil insect's wing from the carboniferous formation of Indiana," which he names *Paolia vetusta*; he considers it allied to the *Ephemeride*, and especially to *Hemeristis* and *Miamia*, stating, however, that Hagen believes it belongs to the same genus as *Dictyoneura libelluloides*, and hence allied to *Eugereon bæckingi*, which Hagen refers to *Dictyoneura*.

ODONATA.

DE SELYS-LONGCHAMPS, "Aperçu statistique sur les Odonates," Tr. E. S. 1871, pp. 409-416, gives a statistical sketch of the number of species already described or known to him. He estimates the total number at 1357 (distributed in 190 genera or subgenera) as follows:—Libellulines 461, Cordulines 83, Gomphines 172, *Æschnines* 108, Calopterygines 160, and Agrionines 373.

The same author, in his "Nouvelle Révision des Odonates de l'Algérie,"

Ann. Ent. Belg. xiv. pp. 9-20, publishes a list of Algerian species, noticing the new discoveries, changes in nomenclature, &c., since the publication of the list in the 'Revue des Odonates,' in 1850. He now enumerates 47 species, of which 5 belong to the purely tropical groups, whose headquarters are in tropical Asia and Africa; 5 are of European facies, but have not yet been found in Europe; the remaining 37 species are European.

PACKARD, in Mem. Peab. Ac. i. no. 2, has a memoir on the development of *Diplax* and *Perithemis*, illustrated by plates and woodcuts.

F. T. KÖPPEN, in S. E. Z. 1871, pp. 183-188, has a chronological *résumé*, from 1494 to 1868, of the records of the flights of swarms of species of Dragonflies, especially *Libellula quadrimaculata*.

MÜLLER, Ent. M. M. viii. p. 127, notices the method of oviposition of *Libellula flaveola*, confirming von Siebold's assertion (concerning *L. scotica*) that the male retains his hold of the female during oviposition, and apparently directs her movements.

M'LACHLAN, in Proc. E. S. 1871, p. xxxix, alludes to the mimetic resemblance existing between the ♀ of *Plathemis trimaculata* and *Libellula pulchella*, and these remarks are followed by a discussion as to the liability of Dragonflies to the attacks of birds; continued at p. xlvii.

Doubleday, Ent. M. M. viii. p. 86, gives a list of 30 spp. occurring near Epping, in Essex.

Dietrich, Ent. Bl. i. pp. 23 & 24, criticizes Duplessis's local list of Swiss species (Mith. schw. ent. Ges. ii.). He states that, of the 56 Swiss species, 44 occur in the Canton Zurich.

Corduliina.

DE SELYS-LONGCHAMPS has published, as a further instalment of his general synopsis of the families of the *Odonata*, a 'Synopsis des Cordulines' (Bruxelles: 1871, pp. 1-128: published also in Bull. Ac. Belg. 1871, pp. 238-316, 519-565; but as the separately published form of the various parts of the series is better known, the Recorder quotes from it in preference). The anticipated arrangement noticed in Zool. Rec. vii. p. 449, has been somewhat modified. The two "Légions" are now termed *Cordulia* and *Macromia*. The first is divided into two "genera," *Cordulia* and *Cordulephya*; and *Cordulia* is subdivided into five "subgenera," *Hemicordulia*, *Cordulia*, *Epitheca*, *Oxygastra*, and *Gomphomacromia*, which are tabulated as under:—

- A. Internal triangle wanting in the posterior wings.
 - a. Anal margin of the posterior wings rounded in the ♂.

Hemicordulia.
 - b. Anal margin of the posterior wings of the ♂ excavated.

Cordulia.
- B. Internal triangle present in the posterior wings.
 - a. Internal triangle of the anterior wings with 2-3 cells.

Epitheca.
 - b. All the triangles without nervules.
 - a. Sectors of the arculus separate at their base .. *Oxygastra.*
 - b. Sectors of the arculus united at their base in the posterior wings.

Gomphomacromia.

The second "Légion," *Macromia*, distinguished from *Cordulia* by the hyper-trigonal area being reticulate, is divided into four "genera," as under:—

Basal space without nervules.

Median space without nervules in all the wings.... *Idionyx*.

Median space reticulated in the anterior, and empty in the posterior wings *Æschnosoma*.

Median space reticulated in all the wings *Macromia*.

Basal and median spaces reticulated in all the wings . *Synthemis*.

The "genus" *Macromia* is further subdivided into two "subgenera," *Macromia* and *Epophthalmia*, the former separated from the latter by the discoidal triangle being more acute inferiorly, and that of the posterior wings shorter, with the external side straight.

The species described amount to 83 in number, and the following are characterized as new:—

Hemicordulia oceanica, p. 17, Tahiti, *assimilis* (Hagen), Celebes, *intermedia*, p. 21, Queensland, *tau*, p. 22, Australia and Fijis, *H. ? novæhollandiæ*, p. 20, New Holland.

Cordulia affinis, p. 26, S.W. Australia, *sericea* (Bates), p. 28, Pará, *libera*, p. 29, Canada, *spinigera*, p. 35, Canada, *basiguttata* (race of *C. cynosura*?), p. 37, Florida and Boston, *costalis*, p. 39, Georgia, *uhleri*, p. 40, Maine and New Jersey.

Epitheca grayi, p. 49, and *braueri*, p. 50, New Zealand, *procera*, p. 51, United States, *semicircularis*, p. 61, Georgia, *cingulata*, p. 68, Newfoundland.

Gomphomacromia androgynis, p. 76, Minas Geraes, *setifera* (Hagen), p. 77, Rio Janeiro, *batesi*, p. 78, St. Paulo.

Cordulephya pygmæa, p. 81, Melbourne.

Idionyx yolanda, p. 83, Singapore.

Æschnosoma elegans (Bates), p. 85, and *forcipula* (Hagen), p. 86, Amazons, *rusticum* (Hagen), p. 87, Bahia.

Epophthalmia frontalis, p. 93, Malayan Islands?

Macromia sophia, p. 113, Cape-Coast Castle, *melania*, p. 114, Old Calabar, *picta* (Hagen), S. Africa, *africana*, p. 117, Nubia, *whitii*, p. 118, Bengal.

Synthemis miranda, p. 121, New Caledonia, *macrostigma* (Hagen), p. 122, Fijis, *leachi*, p. 124, and *guttata*, p. 127, New Holland, *brevistyla*, p. 127, Queensland.

Gomphina.

Onychogomphus genæi. De Selys-Longchamps, Ann. Ent. Belg. xiv. p. 14, describes the hitherto unknown ♂ of this species, and figures the appendages (l. c. p. 20). He considers that the supposed males from Egypt may form a distinct species, closely allied to *pumilio*, for which he proposes the provisional name of *hageni*.

Æschnina.

DE SELYS, Tr. E. S. pp. 412 & 413, reserves the name *Cyrtosoma* of Charpentier for the species, hitherto included in *Anax*, comprising *mediterraneus* and its allies, proposes *Gomphæchna* as a subgeneric division for *Gynacantha*

quadrifida, Rambur, and includes in *Amphiaschna* (as a subgenus) *Æschna irene* &c., distinguished from *Gynacantha* by the reticulated basal space, and from *Neuræschna* by the subcosta, which ends at the nodus.

Calopterygina.

Calopteryx vesta. Doubleday, Ent. M. M. viii. p. 87, is inclined to the opinion that this is specifically distinct from *C. virgo*, having different habits. Cf. Fletcher, *ibid.* p. 161.

Agrionina.

WEIR states that he has personally observed the ♀ of a species of this subfamily descend beneath the surface of the water for the purpose of depositing her ova. Pr. E. S. 1871, p. xxxix.

Agrion tenellum is noticed by the Recorder as occurring at Weybridge. Ent. M. M. viii. p. 65.

Podopteryx [-*ptera* in *Mammalia*, -*pteres* in *Aves*], g. n., Selys, l. c. p. 415. Differs from all other *Agrionina* by having 3 antecubital nervules, and by the basal space being crossed by a nervule; otherwise allied to *Argiolestes*. Type *P. rosconotata*, *id. ibid.*, sp. n., Aru Islands.

Paraphlebia hyalina, sp. n., Brauer, Verh. z.-b. Wien, xxi. p. 105, Mexico.

Agrion deserti, sp. n., Selys, Ann. Ent. Belg. xiv. p. 19, Algeria.

ORTHOPTERA

By R. M'LACHLAN, F.L.S., Sec. Ent. Soc.

GRABER, V. Ueber Polygamie und anderweitige Geschlechtsverhältnisse bei Orthopteren. Verh. z.-b. Wien, xxi. pp. 1091-1096.

The author details experiments regarding polygamy and repeated copulations in some Orthopterous insects. A ♂ and ♀ were observed *in coitu* eight distinct times between the 21st May and 1st June; after the sixth connexion the ♀ commenced to deposit ova: a second ♂, which had already fecundated several females, was then placed with her, and she paired at least five times with him. Analogous results followed experiments upon *Pezotettix pedestris*, and he believes that polygamy and polyandry exist in many species.

OULIANINE, B. [See NEUROPTERA.]

STÅL, C. Orthoptera quædam Africana. Öfv. Vet. Ak. xxviii. pp. 375-401.

Treats of the African *Blattidæ* and *Mantidæ*.

WALKER, F. Catalogue of the Specimens of *Dermaptera saltatoria* in the Collection of the British Museum. Pt. iv. pp. 605-809; pt. v. pp. 811-850, and Supplement, pp. 1-116.

Part iv. is occupied entirely by the *Acridiidæ* as limited by Walker pt. v. contains the *Tettigidæ*; then follows a supplement to the *Blattariæ*

concluding with a supplement to the *Saltatoria*, notes on geographical distribution, and a postscript.

WANCKEL, CARL. Orthopterologische Studien, Z. ges. Naturw., 1871, pp. 1-28.

A posthumous paper, edited by Taschenberg, extracted from the MS. of a work intended to be styled 'Orthoptera Saxonæ,' the publication of which was prevented by the death of the author thirteen years since. Judging from the extracts now published, the work was of a most valuable character, full of biological information. Wanckel appears to have anticipated Graber in his observations on polygamy, &c. (*vide supra*), as evinced by the notes given concerning *Stethophyma grossum* (p. 25). The list of Saxon species is brought down to date of publication by Taschenberg,

A list of species taken in the neighbourhood of Tübingen is given by LEYDIG in Württ. JH. 1871, p. 259.

BLATTIDÆ.

WALKER (l. c. pt. v.) publishes a 2nd Supplement to his Cat. of Blattariæ, in which he modifies his previous arrangement in accordance with that of von Wattenwyl, and describes the following additional new species:—

Polyphaga æqualis, p. 3, S. Mexico.

Panchlora occipitalis and *submarginata*, p. 7, Bombay, *signatura*, p. 13, St. Helena.

Zetobora patula and *phoraspoides*, p. 8, Nicaragua.

Epilampra blaberoïdes, p. 12, Nicaragua.

Blatta? *litrifera*, p. 21, West Coast of N. America, *æqualis*, Tejuca, *innotabilis*, Seychelles, *brevipes*, p. 22, *continua* and *lycoides*, p. 23, *telephoroides*, *subreticulata*, and *figurata*, p. 24, *annulifera*, and *transversalis*, p. 25, *fasciceps* and *subfasciata*, p. 26, *inexacta* and *subrotundata*, p. 27, Bombay, *ramifera*, p. 27, Nepaul, *submarginata*, Cahar, *depressa*, p. 28, *lepida* and *placens*, p. 29, *ramosa* and *concosa*, Australia.

Ischnoptera undulifera, p. 31, Nicaragua, *terranea* and *subcolorata*, p. 32, Bombay.

Polyzosteria coxalis and *heterospila*, p. 35, *scarpustulata* and *circumcincta*, p. 36, Bombay, *subornata*, p. 35, St. Helena.

Periplaneta emittens, p. 37, St. Helena, *monochroma*, p. 37, *ruficornis* and *curta*, p. 38, Bombay.

STÅL, l. c. pp. 375-381, recharacterizes several previously described African species, placing them in modern genera. He describes three subgenera of *Perisphæria* (pp. 378 & 379), viz. *Oncrocorypha* (including *P. cingulata*, Burm.), *Melanosilpha* (including *P. unicolor* and *stylifera*, Burm., and *Blatta ampla*, St.), and *Trichocoma* (including *Heterogamia pilifera*, St.), and three subgenera of *Derocalymna* (pp. 379-381), viz. *Cyrtotria* (including *Ischnoptera gibbicollis* and *macra*, St.), *Hostilia* (including *Blatta proterva*, St.), and *Pollusca* (including *Perisphæria cruralis*, St.).

MANTIDÆ.

SAUSSURE, in 'Mélanges Orthoptérologiques' (Suppl. to fasc. iii. Mém. Soc. Phys. Genève. xxi. pp. 240-336, pl. vii.), redescribes many known species,

with tables and remarks on synonymy, and characterizes the following new genera and species:—

- Dystacta*, p. 323. Type *D. paradoxa*, Cape.
Hestiasula, p. 330. Type *H. brunneriana*, Sylhet.
Eremiaphila arabica, p. 254, Arabia, *brevipennis*, p. 259, *nilotica*, p. 262, Egypt, *sabulosa*, p. 263, Suez.
Chiropacha sancta, p. 269, Natal.
Pyrgomantis nasuta, p. 272, South Africa.
Humbertiella consobrina, p. 273, India.
Archimantis brunneriana, p. 277, North Australia.
Gonypeta (Iridopteryx) nitens, p. 279, Cambodia.
Hierodula (Rhombodera) deflexa, p. 283, Banca; *H. (R.) major*, p. 284, Ternate; *H. (H.) ovata*, p. 285, Amboyna.
Polyspilota brunneriana, p. 286, New Caledonia.
Mantis mandarina, p. 289, Ningpo, *apicalis*, p. 291, Sydney.
Tenodera brevipennis, p. 296, Africa?
Anelos meridionalis, p. 297, *natalensis*, p. 299, South Africa, *pygmaea*, North Australia.
Iris (Fischeria) brunneri, p. 304, Himalaya.
Miomantis caffra, p. 309, Natal.
Nanomantis alaris, p. 312, *snelleni*, p. 313, Moluccas.
Harpax (Pseudoharpax) amena, p. 318, Natal.
Acromantis australis, p. 325, Waigiou.

STÅL, l. c., recharacterizes the following genera:—*Empusa*, p. 382, to which he refers his *Vates wahlbergi* (redescribed); *Sibylla*, p. 384; *Popa*, p. 386; *Danuria*, p. 387; and *Ischnomantis*, 398 (including *Mantis fatiloqua*, St.). He redescribes a new subgenus of *Hierodula*, under the name *Sphodromantis*, p. 390, placing in it *Mantis bioculata* and *lineola*, Burm., and *M. gastrica*, St.; and redescribes his *Sibylla pretiosa*, p. 384, and *Chiropacha maura*, p. 395.

He also describes the following new genera and species:—*Hoplocorypha*, p. 388, type *Mantis macra*, St.; *Hapalomantis*, p. 392, type *M. orba*, St.; *Chroicoptera*, *ibid.*, type *M. vidua*, St.; *Sibylla fuscosparsa* and *Pseudocreobatra wahlbergi*, p. 385, *Gonypeta punctigera*, p. 397, from Caffraria; *Chiropacha afzeli*, Sierra Leone, and *obtusiceps*, Nubia, and *Eremophila hedenborgi*, Nubia, p. 396.

He concludes his paper by a dichotomous table of the genera and subgenera of the subfamily *Mantina*, and indicates therein additional new genera and subgenera, viz.:—*Eremoplana*, p. 398 (type *Thespis guerini*, Reiche); *Sphodropoda* (subg. of *Hierodula*), p. 399 (type *Mantis tristis*, Brauer); *Pentacantha* (type *M. hyalina*, De G.), *Antissa* (type *M. pulchra*, Thbg.), and *Phthersigena* (type *P. conspersa*, p. 401, Cape York, sp. n.), p. 400; *Amorphoscelis*, p. 401 (type *A. annulicornis*, India, sp. n.).

Mantis religiosa. Leydig, Württ. JII. 1871, p. 263, examines the records of the supposed occurrence in Württemberg of this insect, which he believes has been confounded there with *Phaneroptera falcata*.

An account of the mode of construction of the egg-cocoon and oviposition is given by Perrier in Ann. Sc. Nat. (5) xiv. (art. 10) pp. 1 & 2,

PHASMIDÆ.

Phyllium crurifolium. N. JOLY, Mém. Soc. Toulouse (7) iii. pp. 1-30; pls. i.-v., gives an account of the habits, metamorphoses, and anatomy, and figures the details of this species, as observed in several individuals obtained from the Seychelles, and which were for some time living at Toulouse. He combats the opinion of Murray, who studied the development of *P. scythe*, on several points connected with the embryology of the insect.

J. J. KAUP, B. E. Z. xv. pp. 1-24, Taf. i., briefly describes and figures the eggs of 26 species, and, pp. 25-42, Taf. ii., describes the ♀ of *Phibalosoma hypharpax* (Gray), p. 37; characterizes as new genera *Ophicrania*, p. 38, type *O. striaticollis*, sp. n., *ibid.*, New Holland; *Megaacrania*, *ibid.*, type *M. (Platyacrania) alphous* and *phelaus*, Westw.; and also describes the following new species:—

Pachymorpha novæ-guineæ, p. 20, New Guinea.

Diapheroma beckeri, p. 27, *strigiceps* and *bidens*, p. 28, Mexico.

Bacteria cacica, p. 28, and *sartoriana*, p. 29, Mexico, *arampes*, p. 30, Brazil.

Lonchodes duivenbodei, p. 30, Menado.

Acanthoderus occipitalis, p. 31, Celebes and New Guinea; *scops*, p. 32, Brazil; *A. (?) hystrix*, Aru.

Ceroys capreolus, p. 34, Mexico.

Eurycantha rosenbergi, p. 34, New Guinea.

Heteropteryx rosenbergi, p. 35, Java.

Haplopus grayi, p. 36, Moluccas.

Cladoxerus insignis, p. 39, Australia.

Necrosia vipera, p. 39, Celebes, *rosenbergi*, p. 40, Moluccas, *pallescens*, p. 41, Ceylon.

Dinelytron neptunus, p. 41, Brazil.

GRYLLIDÆ.

WALKER (l. c. pt. v.) makes sundry alterations in the nomenclature of his previous catalogue, and describes as new genera *Hemimerus*, p. 2, type *H. talpoides*, sp. n., *ibid.*, W. Africa, and *Microgryllacris*, p. 18, types *australis*, Australia, and *sinensis*, Hong-Kong, *ibid.*, spp. nn., and the following new species:—

Tridactylus nigræneus and *opacus*, p. 1, Ceylon.

Brachytrypes signatipes, p. 2, Bombay.

Gryllus debilis, p. 4, Nicaragua, *facialis* and *humeralis*, p. 5, *transversalis*, *guttiventris*, and *ferricollis*, p. 6, *angustatus* and *lineiceps*, p. 7, *configuratus*, *parviceps*, and *signipes*, p. 8, Bombay.

Nemobius vagus, p. 10, Bombay.

Eneoptera concolor, p. 10, *lateralis* and *alboatra*, p. 11, Bombay, *ædemeroides*, *ibid.*, Ceylon.

Platydictylus notatipes, p. 12, Ceram, *diversus*, Nicaragua, *lituratus*, p. 13, Nicaragua, *pacificus*, Vavou.

Nisitra maculosa, p. 14, Ceram.

Ecanthus filiger, p. 14, Natal, *necydalooides*, p. 15, Ceylon.

Phalangopsis limosa, p. 17, Sierra Leone.

Ecanthus pellucens. Lucas, Ann. Soc. Ent. Fr. (5) i. Bull. p. xxvi, has

some remarks on the habits of this species as observed by him near Honfleur. He discovered the female depositing her eggs in the twigs of *Calluna vulgaris*.

Gryllotalpa vulgaris. KOLAZY, Verh. z.-b. Wien, xxi. pp. 1085-1090, gives the result of some experiments concerning the food of this insect. He arrives at the conclusion that it is carnivorous. An individual devoured about 50 earth-worms between the 18th April and 6th June. Landois, Verh. Ver. Rheinl. 1871, pp. 58, 59, writes on the same subject; and, according to him, the principal food consists of vegetable matters, and he considers the insect does much damage in gardens, &c. by biting off the stems of various plants, though it also devours worms and larvæ.

ACRIDIIDÆ.

GRABER, Verh. z.-b. Wien, xxi. pp. 1097-1102, Taf. ix. discusses and figures the structure of the sound-producing organs of various species.

Caloptenus differentialis is redescribed in P. Ac. Philad. 1871, p. 149, by Thomas, who also describes (*l. c.* p. 151) *Opomala brachyptera*, ♀.

Trachypetra byfo. Trimen notices the habits of this insect as observed by him at Graham's Town, and remarks on the close manner in which it mimics the stones &c. in the locality it frequents, which he attributes to the action of natural selection (*Nature*, iv. p. 333; abstract of paper read at British Association Meeting for 1871).

Aceridium peregrinum. The abundance of this species in Morocco is alluded to by BLACKMORE in Pr. E. S. 1871, p. xxxi.

Tettix schranki. F. B. White, Ent. M. M. viii. p. 15, records the occurrence of an insect which he believes to be this species in Britain, and compares it with the allied species.

WALKER, *l. c.* pts. iv. & v., describes the following new genera and species:—

Eynisacris [*rectius Eunidacris*], p. 639: type *E. extranea*, Monte Video.

Cal[*U*]*acris*, *ibid.*: type *C. pudica*, p. 641, Mexico.

[*H*]*Apalacris*, p. 642: type *A. varicornis*, N. Hindostan.

[*H*]*Abracris*, *ibid.*: type *A. dilecta*, Santarem.

Eupropacris [*rectius Euprepacris*], p. 643: type *E. spectabilis*, Cape of G. Hope.

Chromacris, *ibid.*: *C. (Gryllus) speciosa*, Thunb., and *C. (Aceridium) colorata*, Serv.

Agriacris, p. 645: type *A. ferox*, Columbia.

Opiptacris, p. 650: type *O. hilaris*, New Hebrides.

Syntomacris, p. 651: type *S. vittipennis*, Amazons.

Stenacris, *ibid.*: *S. lanceolata*, Santarem, *concolor*, Para, *chlorizans*, E. Florida, p. 652.

Glaphyacris, p. 653: type *G. nigricans*, Amazons.

Chariacris, p. 654: type *C. dulcis*, Para.

Heteracris, p. 655: *H. ? coniceps*, p. 656, E. Africa, *adjuncta*, p. 657, Sierra Leone, *cognata*, p. 658, Natal, *basalis*, Sierra Leone, *punctipennis*, p. 659, Angola, *annulifera*, Cape, *viridivitta*, p. 660, S. Africa, *perficita*, S. Africa, *speciosa*, p. 661, Sierra Leone, *humeralis*, p. 662, Madagascar, *illustris*, p. 663, S. Hindostan, *elegans*, N. Hindostan, *rudis*, p. 664, Ceylon, *insignis*, Burdwan, *ducalis*, p. 665, *apta*, p. 666, Silhet, *strangulata*, p. 665,

straminea, p. 666, *tenuis*, p. 668, China, *varicornis*, p. 667, S. Hindostan, *antica*, p. 668, Gilolo, *gavisa*, p. 669, Ceram, *simplex*, Philippines, *australis*, p. 670, *conglobata*, p. 671, *lineosa*, p. 673, Australia, *mundata*, p. 672, Port Essington, *plebeia*, Sandwich Isles, *consobrina* and *annulosa*, p. 674, *rejecta* and *vittipes*, p. 675, locality unknown, *H. (?) prasinifera*, Bombay, and *rufitibia*, Java (Supplement), p. 65.

Leptacris, p. 676: type *L. filiformis*, S. Hindostan.

Platacanthus, p. 714: *P. morosus*, S. Africa, *cervinus* and *inclusens*, p. 715, Australia.

Hemiacris, p. 790: type *H. fervens*, Natal.

Morphacris, *ibid.*: type *M. adusta*, S. Africa.

Ceracris, p. 791: type *C. nigricornis*, N. Hindostan.

Ophiostettix [*rectus* *Ophiostettix*], p. 847: type *O. cygnicollis*, New Guinea.

Bufonucris [*vox hybrida*], (Supplement) p. 89: type *B. terrestris*, Straits of Magellan.

Trybliophorus bivittatus, Brazil, *bimaculatus*, Demerara, p. 608.

Cyrtacantharis concolor, p. 610, Mexico?, *simulatrix*, St. Domingo, *unilineata*, p. 611, Indiana, *diversifera*, N. America, *munda*, p. 612, Chili, *compta*, p. 613, Souakin, *rubiginosa*, p. 615, *nanula*, p. 616, North Australia, *imitatrix*, Sydney, *plagiata*, p. 617, Australia, *spissa* and *tenella*, p. 618, locality unknown.

Acridium literosum, p. 620, Galapagos, *decoripes*, p. 621, Rio Janeiro, *proprium*, Oajaca, *marginale*, p. 622, Para, *maculiferum*, Monte Video, *pantherinum*, p. 623, Mexico, *stipatum*, p. 624, Congo, *adustum*, E. Africa, *finale*, p. 625, Fantee, *genuale*, E. Africa, *fumidum*, p. 626, S. Africa, *exemptum*, Madagascar, *albidiferum*, p. 627, Arabia, *sinense*, p. 628, *delineolatum*, p. 631, China, *saturatum*, S. Hindostan, *coreanum*, p. 629, Corea, *innotabile*, Ceylon, *dorsale*, p. 630, Hindostan, *punctarium*, S. Hindostan, *nitidulum*, p. 631, S. Hindostan, *dubium* and *tarsale*, p. 632, Ceylon, *tenebriferum*, p. 633, Celebes, *obtusum* and *exclusum*, p. 634, N. Australia, *alienum*, p. 634, *pilipes* and *virescens*, p. 635, Australia, *elongatum* and *consobrinum*, p. 636, *obliquum*, p. 637, locality unknown.

Orya fasciata, p. 646, Madagascar, *concolor*, Hindostan, *grylloides*, p. 649, Ceram, *antica*, Philippines.

Culoptenus repletus, p. 678, U. States and Vancouver's Island, *bilituratus*, p. 679, *scriptus*, p. 681, Vancouver's Island, *fasciatus*, p. 680, Hudson's Bay, *extremus* and *arcticus*, p. 681, Arctic America, *selectus*, p. 682, Oajaca, *mexicanus*, Orizaba, *dominator*, p. 683, Para, *alienus*, p. 684, Quito, *testaceus*, p. 685, *scriptipennis*, p. 686, Arabia, *discoidalis*, p. 686, Lower Egypt, *concisus* and *signatus*, p. 687, E. Africa, *turbidus*, p. 688, Egypt, *mutator*, p. 689, Egypt and Arabia, *cincticollis*, Mt. Sinai, *saturatus*, p. 692, Zulu, *crassus*, p. 694, S. Africa and Natal, *illepidus*, Natal, *pinguis*, p. 695, S. Africa, *sulphureus*, Natal, *plenipennis*, p. 696, S. Africa, *sordidus*, p. 697, Natal, *stramineus*, Whydah, *ferrifer*, p. 698, S. Africa, *quadratus*, Congo, *minor*, p. 699, S. Africa, *strenuus*, Gambia, *conscitus*, p. 700, S. Africa, *decisus*, p. 701, Madagascar, *insignis*, p. 701, Hindostan P, *glaucopsis*, p. 702, N. Hindostan, *liturifer*, p. 703, S. Hindostan, *erubescens*, Bengal, *scutifer*, p. 704, S. Hindostan, *sinensis*, p. 705, *signatipes*, p. 706, China, *dominans*, p. 705, Silhet, *ferrugineus*, N. Bengal, *scaber*, p. 707, Burdwan, *nepalensis*, Nepaul, *strictus*, Borneo, *concoloratus*, p. 708, *lepidus*, p. 709, *lutescens*, p. 710, Australia, *marginalis*,

New Zealand, *clarus*, p. 711, *obliterans* and *inscitus*, p. 712, *basifer* and *reductus*, p. 713, locality unknown.

Pachytylus brasiliensis, p. 724, Brazil, *pardalimus*, p. 725, S. Africa.

Edipoda parviceps, p. 732, West Coast N. America, *transtrigata*, p. 733, Oajaca, *atrifera*, p. 735, St. Iago, *speciosa*, Honduras, *abrupta*, p. 739, Natal, *suturata*, p. 740, Ceylon, *venusta*, S. Hindostan, *crassa*, p. 741, N. Bengal, *infecta*, p. 742, Ceylon, Bengal, and Sandwich Islands, *rotundata*, p. 743, N. Bengal, *sobria*, p. 744, *guttulosa*, p. 745, Australia, *notabilis*, Sandwich Isles.

Stenobothrus subconspersus, p. 755, Florida, *mexicanus*, p. 756, Oajaca, *decisus*, p. 757, St. Domingo, *gratiosus* and *expandens*, p. 758, *rugulosus*, p. 760, Santarem, *costalis*, p. 759, Brazil, *concinulus*, Para, *arctatus*, p. 761, Honduras, *viridissimus*, Honduras, *comptus*, p. 762, Sierra Leone and Congo, *productus*, p. 763, Gaboon, *minusculeus*, Cape, *capensis*, p. 764, S. Africa, *ornatus*, Madagascar, *vittifrons*, p. 765, New Holland, *lativittatus*, p. 766, Australia, *propinquus*, King George's Sound.

Epacromia costistrigā, p. 767, Santarem, *thoracica*, p. 769, Sierra Leone, *plena*, S. Africa, ? *prasina*, p. 770, Cape, *repleta*, p. 771, W. Africa, *pallida*, p. 772, W. Africa, *conturbata*, Cape, *inclyta*, p. 773, Madagascar, *simulatrix*, S. Hindostan, *varia*, p. 774, China, *aspersa*, p. 775, N. Hindostan, *twipis*, N. Bengal, *turbata*, p. 776, Ceylon, *nigricans*, Borneo, *terminifera*, p. 777, Australia, ? *grata*, p. 778, Swan River, *pusilla*, Australia, *turbida*, p. 779, Australia, *oceanica*, Sandwich Isles, *partita*, p. 780, locality unknown.

Chrysochraon filatum, p. 785, Santarem.

Orycoryphus tibialis, p. 787, Oajaca.

Hyalopteryx ? *australis*, p. 788, Moreton Bay.

Mastax mantispoides, p. 792, China.

Trachiptera scutigera and *scutellaris*, p. 796, S. Africa.

Ommexecha gracilis, p. 798, Santarem.

Pneumora membracioides, p. 800, Natal.

Tettix hastata, p. 816, Demerara, *attenuata*, *ibid.*, and *ruficornis*, p. 817, *zonata*, p. 818, Santarem, *maura*, p. 817, Brazil, *telifera*, Sierra Leone, *jugata*, p. 819, Natal, *subpustulata*, S. Africa and Natal, *odiosa*, p. 820, Cape, *infausta*, S. Africa and Natal, *vittata*, p. 821, Natal, *pallipes* and *alceria*, Sierra Leone, *nodifera*, p. 822, N. China, *pellitarsis*, *ib.*, and *cervina*, p. 823, China, *munda*, p. 823, N. Hindostan, *umbrifera*, *lineifera*, and *vittifera*, p. 824, Bombay, *dorsifera* and *obliquifera*, p. 825, *nigricollis*, p. 826, Bombay, *discedis*, Ceylon, *armigera*, Hong Kong, *cingalensis*, p. 827, Ceylon, *reducta*, China, *plana*, p. 828, China, *quadriplagiata*, N. Hindostan, *balteata*, S. Hindostan, *notata*, p. 829, Hong Kong, *cucullifera*, Amoy, *subcucullata*, p. 830, Ceylon, *morbillosa*, p. 832, Borneo, *producta* and *sobria*, p. 831, *minax*, p. 832, *ensatrix*, *gladiatrix*, and *cultatrix*, p. 833, *consocia* and *femoralis*, p. 834, Philippines, *inornata*, p. 834, Birmah, *compacta* and *miseria*, p. 835, Java, *australis*, p. 836, Australia, *simplex*, p. 836, *latispinā* and *ignobilis*, p. 837, *rudis*, *albescens*, *humeralis*, and *latifera*, p. 839, locality unknown.

Scelymena nodosa, p. 840, Ceylon, *extensa*, p. 841, Java, *contracta*, Hindostan.

Amorphopus gibbosulus, p. 842, Rio Negro.

Cladonotus horrendus, *ibid.*, Sierra Leone, *pelops* and *turriter*, p. 843, Ceylon, *securifer* and *cristicornis*, p. 844, Philippines, *horridus*, Natal.

Choriphyllum plagiatum, p. 845, Jamaica.

The following spp. nn. are described *l. c.* Supplem. part v. :—

Tryxalis sinensis, p. 49, China, *diminuta*, p. 50, China.

Pyrgomorpha rosacea, p. 50, South Africa and Natal.

Opomala ? *syriaca*, p. 51, Syria, *stenobothroides*, p. 52, Nicaragua, *javanica*, Java, *tenebrosa* *, p. 53, Yunan.

Xiphocera interrupta, p. 54, S. Africa, *fumida*, S. Hindostan, *vittifera*, p. 55, Natal.

Akicera [*rectius* *Acicera*] *lineosa*, p. 55, S. Africa.

Petasida concinna, p. 57, locality unknown, *discrepans*, p. 58, Australia.

Cyrtacanthus obliqua, p. 58, China, *punctipennis* *, p. 60, Yunan, *cribrifrons*, Gambia.

Acridium continuum, p. 61, Mount Sinai, *subpustulatum*, *ib.*, and *pustuliferum*, p. 62, W. Australia, *scitulum*, p. 62, and *obtusiferum*, p. 63, locality unknown.

Oxya diminuta *, p. 64, Yunan.

Caloptenus ? *dorsiger*, p. 66, Chili, *strigifer*, *ib.*, *immunis*, p. 67, *pustulipennis*, p. 68, Bombay, *inamemus* *, *ib.*, *incomptus* *, p. 69, Yunan, *caliginosus*, p. 69, *spissus*, p. 70, locality unknown.

Pachytylus determinatus, p. 72, S. Africa, Abyssinia, and Sierra Leone.

Ædipoda tentatrix, p. 74, Oajaca, *granulosa*, p. 76, Beloochistan.

Stenobothrus notabilis, p. 79, Oajaca, *mundus*, *ib.*, *decisus* and *apicalis*, p. 80, *epacramoides* and *turbatus*, p. 81, *luteipes*, *strigulatus*, and *simplex*, p. 82, Bombay, *inclutus*, p. 83, *rectus*, *subrufescens*, and *umbrifer*, p. 84, locality unknown.

Epacromia selecta, Amazons, *collecta*, St. Iago, p. 84.

Mystax innotata *, p. 88, Yunan.

Tettix lineosa, p. 90, Bombay.

Mesops wyomingensis, sp. n., Thomas, P. Ac. Philad. 1871, p. 152, Wyoming.

LOCUSTIDÆ.

WALKER (*l. c.* Suppl. pt. v.) notes changes in nomenclature, and describes the following new genera and species :—

Phæophilacris, p. 23 : type *P. funesta*, Sierra Leone.

Callimenes, p. 25 : type *C. fumidus*, China.

Metholce, p. 29 : type *M. nigratarsis*, Moreton Bay.

Aganacris, p. 41 : type *A. micans*, St. Paulo.

Aperisis, p. 46 : type *A. albidifer*, Constancia.

Anonistus [*?Anoistus*], p. 47 : type *A. obliterans*, Brazil.

Clisis, *ibid.* : type *C. annulicornis*, Brazil.

Acanthodiphrus, p. 48 : type *A. conspersus*, Nicaragua.

Gryllacris signigera, p. 19, Bombay, *simplex*, p. 20, Ceylon, *marginalis*, Australia, *lepida*, W. Australia.

Lezina longipes, p. 21, locality unknown.

Hadenæcus poduroides, p. 22, Australia.

Ceuthophilus lepismoides, p. 23, Australia.

Libanara pallitarsis, p. 24, New Zealand.

* These species are also described as new by Walker in P. Z. S. 1871, pp. 246-248, without reference to any other descriptions.

- Natricia lutea*, p. 34, Australia.
Xiphidium sinense, p. 35, China.
Locusta ? *straminula*, p. 36, Bombay.
Conocephalus breviceps, p. 37, locality unknown.
Pseudorhynchus africanus, p. 38, W. Africa.
Phaneroptera nigrosparsa, p. 39, Bombay, *juncea*, Australia, *punctifera*, p. 40, Australia, *cornuta*, Australia.
Valna nigropicta, p. 41, Para.
Microcentrum vividum, p. 42, Orizaba.
Phylloptera intacta, p. 42, Nicaragua.
Pseudophyllus vittifer, p. 43, Sierra Leone, *nigrostrigatus*, p. 44, Vavon.
Aprion curviferum, p. 44, *strictum*, p. 45, Bombay.
Meronicidius vittifrons, p. 45, Nicaragua.
Mecopoda frontalis, p. 48, Sierra Leone.
Rhaphidophora stygia and *subterranea*. The habits of these two cave-frequenting species are noticed in Am. Nat. v. pp. 745 & 746, and the latter is figured.

Dinacrida. Buller, Tr. N. Z. iii. pl. v. *b*, notices the habits of three described species from New Zealand, viz. *D. heteracantha* (White), *thoracica* (Gray), and *megacephala* (Buller) with figure. He also describes and figures a n. sp. from the Wanganui district, under the name of *D. rugosa*. (The Recorder has seen only an author's copy of this paper.)

RHYNCHOTA

By E. C. RYE.

OSCHANINE, B. [Liste des Hémiptères des environs de Moscou.]
 Nachr. Ges. Mosc. vi. pt. 3 (1870), pp. 46.

This pamphlet (forming part 3 of the Matér. Ent. Mosc.) escaped notice in Zool. Rec. vii. It is written in Russian, with the exception of a few Latin words, and consists of a catalogue of *Heteroptera* and *Homoptera*, with some synonymy and indications of dates and localities. Two new species are described in it; but other original remarks (chiefly concerning the *Homoptera*) are beyond the Recorder's power of translation.

STÅL, C. Hemiptera insularum Philippinarum.—Bidrag till
 Philippinska öarnes Hemiptér-fauna. Öf. Vet. Ak. xxvii.
 pp. 607-776, pls. vii.-ix.

This includes the *Homoptera*, and chiefly consists of descriptions of new genera and species. Some synonyms and (in notes) useful tables of genera are given by the author, who (p. 603 *et seq.*) also publishes a list of 119 species out of the 520 taken by Semper in the Philippines, and which have been recorded from other localities. On the tables, are occasional indications of apparently new genera.

HEMIPTERA HETEROPTERA.

MULSANT, E., & REY, CL. Histoire naturelle des Punaises de France. Mém. Ac. Lyon, xviii. pp. 185-434, pls. i. & ii. (also separately. 8vo. Paris: 1870).

This 3rd instalment of the author's work treats of the *Coreides*, *Alydides*, *Berytides*, and *Stenocephalides*,—the *Scutellerides* having been published in 1865 and the *Pentatomides* in 1866. From Puton's remarks in Ann. Soc. Ent. Fr. (5) i. p. 303, this part, though dated in October, 1870, was apparently not actually published until August, 1871. One new genus and a few new species are characterized in it. The plates are outlines of 4 species, with some details.

Puton (*l. c.*) analyzes this work, comparing his own views with those of the authors, giving a table containing two more groups than they adopt, viz. *Prionotylus* (*Prionotylus*, Fieb.) and *Corizii* (including *Chorosoma*, Curt.), and objecting to the arbitrary alteration of names for the sake of euphony, and to the adoption of Amyot's mononymic generic divisions.

PUTON, A. Catalogue des Hémiptères Hétéroptères d'Europe, Paris: 1869, pp. 40.

Some synonymy is given.

REUTER, O. M. Pargas sockens Heteroptera. Not. Fenn. xi. (n. s., viii.), pp. 309-326, pl. i. figs. 5-76.

Supplements J. Sahlberg's former account of Finland *Heteroptera* by notices of 108 species occurring in the south-west districts, and of which 13 are first recorded as indigenous, 5 of them being treated as new.

SAHLBERG, JOHN. Hemiptera Heteroptera samlade under en resa i ryska Karelen sommaren 1869. *Ibid.* pp. 277-307, pl. i. figs. 1-4.

Contains localities for, and other particulars concerning, 190 species, whereof 32 (including 8 treated as new to science) are recorded as Finnish for the first time. One new genus also is characterized.

WALKER, FRANCIS. Catalogue of the Specimens of Hemiptera Heteroptera in the Collection of the British Museum. Part iii. pp. 419-599 (1868); iv. pp. 1-211 (1871).

The new species described in Pt. iii. will be found in their places in this 'Record,' having been omitted from Zool. Rec. v. & vi. (in which latter only the new genera are mentioned). That part completes the *Scutata*; pp. 505-578 consisting of addenda to Pts. i. & ii. A table of the geographical distribution of the species mentioned is given at p. 579.

Part iv. treats of the *Supercornia*. The author's accustomed plethora of new genera and species will be found in both parts; and some synonymy is given, for the most part apparently at second-hand. Some unnamed varieties are described, to which specific rank may hereafter be accorded. The principal divisions, genera, and sometimes species are tabulated, with diagnostic characters.

MAYR (Verh. z.-b. Wien, xxi. p. 21) briefly reviews Stål's "Enumeratio Hemipterorum" (Sv. Ak. Handl. ix.).

Alpine species: Frey-Gesner (Mitth. schw. ent. Ges. iii. p. 319 *et seq.*) gives a list, with brief references to localities and habits.

Rare British species are recorded by Champion, Ent. M. M. vii. p. 184; by E. Saunders, l. c. viii. p. 110; by Douglas, *ibid.* p. 136.

Synonymy of British species: Douglas and Scott, *ibid.* pp. 61-63, abstract Stål's remarks in Hemipt. Fabric. and Syn. Sald. Sueciæ.

PACHYCORIDÆ.

Cantao rufipes, Dall., = *ocellatus*, Thunb.; *Tetrarthria 5-maculata*, Dohrn, and ♀ *marginata punctata*, Voll., = *variegata*, Dall.; *Tectocoris banksi* and *cyanipes*, Dall., = *diopthalmus*, Thunb., of which 2 varr., named *rufus* and *tagalicus*, are described, p. 617; *Tetrarthria mesozona*, Walk., = *Cosmocoris sellatus*, White; *Callidea consul*, Voll., = *Chrysocoris germari*, Esch.: Stål (Æfv. Vet. Ak. xxvii. p. 616 *et seq.*), who describes the following new genera and species from the Philippine Islands:—

Hyperoncus, p. 615. Allied to *Spharocoris*. *H. punctellus*, *ibid.*

Brachyaulax, p. 616. Allied to *Scutellara*. *B. rufimaculata*, *ibid.*

Philia geniculata, p. 617.

Walker, Cat. Hem. Heteropt. Brit. Mus. pt. iii., describes the following new species:—

Spharocoris subnotatus, p. 505, N. Australia.

Cantao inscitus, p. 506, *conscitus*, p. 507, Batchian.

Scutellera pubescens, p. 507, Sumatra.

Tetrarthria amœna, p. 508, Sumatra.

Libyosa purpurascens, p. 509, E. Africa.

Callidea flammigera, p. 512, Celebes; *melanophora* and *sodalis*, p. 513, Batchian; *distermina* (p. 578; script. *distinguenda*), Sumatra, *quadrifera* [no locality given], p. 514.

Symphylus granulatus, p. 516, Archidona; *divergens* and *apicifer*, *ibid.*, *bipustulatus*, *deceus* (p. 578; script. *divergens*), *signatus*, p. 517, *ramivitta* p. 518, Amazons; *politus*, p. 518, S. Domingo; *oculatus*, p. 519, Demerara.

PODOPIDÆ.

Podops funesta, *id.* l. c. p. 521, Penang.

PLATASPIDIDÆ.

Coptosoma atmarium, Voll., = *cribrarium*, Voll., ♂: Stål, l. c. p. 613.

Oscia, g. n., *id.* l. c. p. 614. Allied to *Coptosoma*, differing in the shape of its head and the position of its ocelli. *O. flavescens*, sp. n., *id.* *ibid.*, Philippines.

Coptosoma angulare, p. 611, *consersum*, *obtusiceps*, p. 612, *pallidum*, p. 613, Philippines, *id.* l. c.; *C. suberuciatum*, *strenum*, p. 523, *cyathigerum*, p. 524, *apiciferum*, *erythrospila* [-lus, vel -lotum], p. 526, Batchian, *polyspila* [-lotum], p. 524, *microstigma*, p. 525, Kaisan, *quadriplagiatum*, p. 524, *gutticinctum*, p. 525, Celebes, Walker, l. c.: spp. nn.

Brachyplatys medius, sp. n., *id.* l. c. p. 527, Senegal.

ASOPIDÆ.

Platynopus melanoleucus, Westw.: Stål, *l. c.* p. 619, describes 4 varr. from the Philippines.

Stilbotes, g. n., *id. l. c.* p. 620. Probably near *Leptolobus*. *S. semperi*, sp. n., *id. ibid.* pl. vii. fig. 1, Philippines.

Canthecona latipes, sp. n., *id. l. c.* p. 619, same locality.

Bodetria chrysochlora, indecora, p. 528, Amazons, *scutellaris*, p. 529, V. Cruz: Walker, *l. c.*, spp. nn.

Platynopus purpurascens, sp. n., *id. l. c.* p. 530, Ceram.

Macrorhaphis infuscata, Whydah, *spurcata*, Natal, p. 531: *id. l. c.*, spp. nn.

Arma velata, p. 532, Hindostan, *japonica*, p. 533, Japan: *id. l. c.*, spp. nn.

CYDNIDÆ.

Cydnus and *Æthus*: for observations on these generic names, cf. E. Saunders, Ent. M. M. viii. pp. 110 & 161.

Æthus omicron, p. 534, Ceylon, *scitus*, p. 535, S. Domingo: Walker, *l. c.*, spp. nn.

Acatalectus clarus, sp. n., *id. l. c.* p. 535, Hindostan.

SCIOCORIDÆ.

Ædnus similis, Hagl., = *obscurus*, Dall.; *Myrochea*, *Paramecocoris*, *Ennius*, *Erachtheus*, *Cocalus*, *Laprius*, and *Ædnus* are characterized and associated as "*Myrocheina*," and *Dymantis*, *Aeptus*, *Menestheus*, and *Erebotes* as "*Aeptina*": Stål, *l. c.* pp. 623 & 624.

Sciocoris lugubris, p. 538, Formosa, *indicator*, p. 539, Queensland: Walker, *l. c.*, spp. nn.

Cephaloplatys pallipes, sp. n., *id. l. c.* p. 541, no locality given.

HALYDIDÆ.

Ochrophara, g. n., Stål, *l. c.* p. 626. Dubiously placed here by the Recorder, as the author likens it to "*Brachymna*," which may be either intended for *Brochymena*, Am. & S., in this family, or *Brachynema*, Muls. & R., in the next. Compared with the genus mentioned, it is stated to be much less depressed and somewhat convex beneath. *O. emarginata*, sp. n., *id. ibid.* pl. vii. fig. 2, Philippines.

Dinidor strigatus, sp. n., Walker, *l. c.* p. 542, Amazons.

Chlorocoris rufidens [no locality], *rubescens*, Orizaba, p. 543, *rufopictus*, p. 544, Mexico: *id. l. c.*, spp. nn.

Pæcilometis binotatus, p. 544 [no locality], [*mundus*, p. 545, Moreton Bay: *id. l. c.*, spp. nn.

Agonoscelis femoralis, p. 545, Hindostan, Banda, (*A.?*) *rufescens*, p. 546, Gambia: *id. l. c.*, spp. nn.

Ectenus cereus, sp. n., Stål, *l. c.* p. 621 (and another sp. n., doubtfully proposed as *E. brevirostris*, p. 622), Philippines.

Dalpada tagalica, sp. n., *id. l. c.* p. 622, same locality.

PENTATOMIDÆ.

Stelcocoris, Mayr, = *Antonia*, Stål, = *Hypaulacus*, Spin.; a subgenus of *Axiagastus*, Dall., is proposed (p. 629) and named *Oncotropis*; the genera allied to *Rhynchocoris*, forming a division "*Rhynchocorina*," are tabulated (p. 637, note): *id. l. c. p. 627 et seq.*

Strachia oleracea. Künstler (Verh. z.-b. Wien, xxi. Beih. p. 46) discusses injuries to cultivated plants from this species.

Eurydema ornatum, F. Sahlb., = *festivum*, Linn.: J. Sahlberg, Not. Fenn. xi. p. 282.

Perillus circumcinctus is described as attacking the larva of the Colorado Potato-beetle at Ontario, by Reed (Canad. Ent. iii. p. 170, f. 36).

The genera allied to *Acanthosoma* are tabulated by Stål, *l. c. p. 638*, note.

New genera and species:—

Stachyomia, *id. l. c. p. 628*. Allied to *Hoplistodera*, but with shorter scutellum, spinose angles to apical segment of abdomen, and a smaller and shorter head. *S. vulnerabilis*, *id. l. c. p. 629*, Philippines.

Brachycoris, *id. l. c. p. 633*. Near *Antestia*, but with acute anterior angles to thorax, very large scutellum, no mesosternal keel, &c. *B. semistavus*, *id. l. c. p. 634*, pl. vii. fig. 3, Philippines.

Euschistus biformis, Mexico, *comptus*, Oajaca, p. 550: Walker, *l. c.*

Dicræus piceus, *id. ibid.*, Hindostan.

Mormidea tetra, p. 551, Oajaca; *melanocantha*, p. 552, St. Domingo; *pulchella*, *ibid.*, *basalis*, p. 553, Santarem; *semialba*, p. 553, Constancia; *nigriceps*, Hindostan, *detersa*, Ceram, p. 554; *erythrospila*, Celebes, *ventralis*, Pt. Essington, p. 555: *id. l. c.*

Odius pallipes and *latus*, Stål, *l. c. p. 624*, Philippines.

Nyphæ vittativentris, *id. l. c. p. 625*, same locality.

Eurynome (gen. char. amended) *fasciaticollis*, *id. l. c. p. 627*, same locality.

Axiagastus (*Oncotropis*) *carinatus*, *id. l. c. p. 630*, same locality.

Platysolen obscurus, J. Sahlberg, Not. Fenn. xi. p. 281, Russian Carelia and R. Lapland.

Eusarcocoris insocius, p. 556, Hindostan, *latus* and *pustulatus*, p. 557, Formosa, (*E.?*) *truncatellus*, p. 558, Australia, Walker, *l. c.*; *E. mayeti*, Mulsant and Rey, Ann. Soc. L. Lyon, n. s. xviii. p. 99 (Op. Ent. xiv. p. 123), Pyrenees.

Antestia annulifera, p. 558, Natal, *megaspila*, p. 559, Hong Kong, Walker, *l. c.*; *A. angulosa*, Stål, *l. c. p. 630*, Pulo Penang.

Stenozygum tricolor, *id. l. c. p. 631*, Philippines.

Plautia unicolor, *id. l. c. p. 632*, same locality.

Zangis nigromarginata, *ibid.*, and *inornata*, p. 633, *id. l. c.*, same locality.

Pentatoma immunis, C. G. Hope, *obtusa*, Japan, p. 560; *latifrons*, p. 561, Queensland: Walker, *l. c.*

Cimex (*Palomena*) *annulata*, Puton, Pet. Nouv. p. 124 (diagnosis only), and Mitth. schw. ent. Ges. iii. p. 416, Bone.

Strachia postica, Amazons, *humeralis*, Queensland, p. 562; *lætabilis*, p. 563 [no locality], Walker, *l. c.*; *S. consobrina*, Puton, *l. c.* (diagnosis only), and Mitth. schw. ent. Ges. iii. p. 415, Bone.

Cataulax decoloratus, *annulicornis*, p. 564, *punctipes*, p. 565, *centralis*, p. 566, Amazons; *subtrittatus*, p. 565, Brazil: Walker, *l. c.*

- Rhaphi[do]gaster perornatus*, Whydah, *quinquemaculatus*, Formosa, p. 567, *indecorus*, *discoidalis*, New Guinea, *pallescens* [no locality], p. 568: *id. l. c.*
Prionaca exempta, *id. l. c.* p. 569, N. Hindostan.
Cuspicona firmata, p. 569, China, *strenua*, Celebes, *proxima*, Ceram, p. 570, *minotata*, *intacta*, p. 571, Australia, *strenuella*, p. 572 [no locality], *id. l. c.*;
C. rufispina, Stål, *l. c.* p. 636, Philippines.
Sastragala obtusispina, p. 638, *spiculigera*, p. 639, *id. l. c.*, same locality.
Elasmucha longirostris, p. 639, *ferruginosa*, p. 640, *id. l. c.*, same locality.
Microdeuterus pallescens, *id. l. c.* p. 641, same locality.
Rhynchocoris longirostris, p. 634, *brevirostris*, *nigridens*, p. 635, *id. l. c.*, same locality.
Acanthosoma immundum, *alaticorne*, p. 573, *nigricorne*, p. 574, Hindostan: Walker, *l. c.*
Sala exigua, *id. l. c.* p. 575 [no locality].

UROSTYLI[DI] DÆ.

- Urostylis lævipennis*, p. 641, *serrulata*, *cruciata*, p. 642, Stål, *l. c.*, Philippines: spp. nn.
Urolabida bipunctata, *id. l. c.* p. 641, same locality; *U. octomaculata*, Walker, *l. c.* p. 576, Sarawak: spp. nn.

EDESSIDÆ.

- Pygoplatys*. A subgenus, *Odontoteuchus*, indicated: Stål, *l. c.* p. 643.
 Variations in *Aspongopus* noted, and tarsi of *Eumenotes* stated to be 2-jointed: *id. l. c.* p. 645.

New species:—

- Edessa lineosa*, p. 422, *trifurca*, p. 423, Orizaba; *euchroma*, p. 422, V. Cruz; *longispina*, p. 431, *hamata*, *antica*, p. 432, *globulifera*, *ductor*, p. 433, *albocincta*, p. 434, *aciculata*, p. 435, *xanthomelæna*, *balteata*, p. 436, *pallicornis*, *graminosa*, p. 437, *femoralis*, p. 440, *humeralis*, p. 441, *bimaculata*, p. 442, *peccatoralis*, p. 443, *melanocera*, *submarginata*, p. 444, *electa*, *inclyta*, p. 445, *excellens*, *nigriclava*, p. 446, *strigiceps*, *congrua*, p. 447, *jucunda*, *rectangulata*, p. 448, *contermina*, p. 449, *senilis*, p. 450, Amazons; *strigiventris*, p. 434, *consentanea*, p. 450, Tejuca; *gaudens*, p. 434, *innotabilis*, p. 438, *hilaris*, p. 440, Constancia; *megaspil[ot]a*, p. 435, Columbia, Venezuela; *inscripta*, p. 438, R. Janeiro; *rulis*, p. 439, S. America; *reversa*, p. 439, Archidona; *caliginosa*, p. 442, ? Brazil; *rutilans*, p. 449, Brazil; *ventralis*, p. 443, Guatemala; *turpis*, p. 449, Cayenne: Walker, *l. c.*
Aceratodes sigillatus, *cordifer*, p. 452, *privatus*, p. 453, Mexico: *id. l. c.*
Brachystethus biguttatus, p. 455, *marginifer*, *piceolus*, p. 456, Amazons: *id. l. c.*
Piezosternum retracts, p. 457, Amazons; *firmatum*, *cribratum*, p. 458, Malacca; *ingenium*, p. 459 [no locality]: *id. l. c.*
Pygoplatys lancifer, p. 460, *trucidus*, p. 461, Sarawak, *id. l. c.*; *P. bovis* and *P. (Od.) longiceps*, p. 643, *hædulus* and *rosulentus*, p. 644, Stål, *l. c.*, Philippine I.
Tesseratoma striata, Lomboek, *furcifera*, Siam, p. 463; *timorensis*, Timor,

clara, Ceylon, p. 404; *forticornis*, p. 405, Sarawak; *semicuprea*, *ibid.*, *opposita*, p. 406 [no locality]: Walker, *l. c.*

Amissus nitidus, *id. l. c.* p. 406, Sarawak.

Siphnus dilatatus, *id. l. c.* p. 467, Siam.

Mattiphus hians, Stål, *l. c.* p. 644, Philippines.

Pycnum rubidum, p. 471, Mt. Ophir; *stabile*, p. 472, *pallipes*, p. 473, Hindostan; *smaragdiferum*, p. 472, Siam: Walker, *l. c.*

Dalcantha regia, *id. l. c.* p. 474, Silhet.

Lyramorpha ramifera, *id. l. c.* p. 476, New Guinea.

Cyclopelta ornata, Stål, *l. c.* p. 645, Philippines; *C. dorsalis* and *vitis*, p. 478, W. Africa, *dotata*, p. 479, Natal, Walker, *l. c.*

Aspongopus circumcinctus, p. 483, Hindostan, *æneus*, Celebes, *solitus* [no locality], p. 484: *id. l. c.*

PHYLLOCEPHALIDÆ.

Walker, *l. c.*, describes the following new species:—

Phyllocephala impressa, p. 489, Old Calabar; *humeralis*, W. Africa, *funesta*, Gaboon, p. 490; *albidicosta*, S. Africa, *subtruncata*, E. Africa, p. 491.

Tetroda bilineata, p. 494, Hindostan, Birmah, Java, Sumatra.

Diplorhinus sinensis, *ibid.*, N. China, Hong Kong.

Schismatops insignis, p. 495, Birmah.

Macrina scita, p. 496, W. Africa, *coccinea*, Hindostan, Penang, *vacillans*, China, p. 497.

Megarhynchus diversus, p. 498, Hindostan.

Dichelorhinus indicator, p. 499, Lake N'Gami.

MEGYMENIDÆ.

Stål, *l. c.* p. 645, under the title "Subf. DINIDORINA," includes *Aspongopus* and *Cyclopelta* with the 2 genera usually associated under the above title.

Megymenum basale, Sarawak, *instructum*, N. Guinea, Walker, *l. c.* p. 502: spp. nn.

SPARTOCERIDÆ.

Sephina atra, sp. n., Walker, *l. c.* pt. iv. p. 4, Mexico.

Spartocera chilensis, Chili, *lampyr[id]oides*, Oajaca, p. 6: *id. l. c.*

Menenotus diminutus, *id. l. c.* p. 7, Brazil.

MICTIDÆ.

Mictoides, g. n., Walker, *l. c.* pt. iv. p. 38. Allied to *Amorbus*. *Mictis marginalis* and *triguttata*, Wlk.

New species:—

Cipia guttipes, Stål, *l. c.* p. 646, Philippines.

Derepteryx expansa, *id. ibid.*, same locality; *D. truncata*, Walker, *l. c.* p. 11, Sarawak.

Mictis pungens, Stål, *l. c.* p. 647, Philippines. *M. luteitarsis*, p. 19, Whydah, Old Calabar; *biplagiata*, p. 22, *ferrifera*, p. 24, *amplectens*, p. 25, Hindostan; *japonica*, p. 23, Japan; *insularis*, p. 26, *biserrata*, p. 29, Celebes;

flicornis, p. 27, *lateralis*, p. 30, Sarawak, Borneo; *insolita*, p. 27, Dorey, New Guinea; *amboinensis*, p. 28, Amboina; *javana*, p. 30, Java: Walker, *l. c.*

Trematocoris pardalipes, p. 33, ? Sumatra; *notatipes*, p. 34, *patulicollis*, p. 37, Hindostan; *subvittata*, p. 34, Cahar; *bicoloripes*, Penang, *porrigens* [no locality], p. 35; *vittata*, p. 36, Siam; *elegans*, p. 37, Sarawak: *id. l. c.*

Sulpicia limosa, p. 39, Natal: *id. l. c.*

Amorbus planus, p. 42, Australia: *id. l. c.*

Metapodius constrictus, p. 47, Barbadoes; *sericeicollis*, p. 49, Demerara, Brazil; *distinctus*, p. 50, Tejuca; *affinis*, p. 51, Venezuela: *id. l. c.*

Melucha atra, *aurulenta*, p. 55, W. Africa; *notatipes*, Siam, *octolineata*, Aru, p. 56: *id. l. c.*

Piezogaster patula, p. 57, Old Calabar: *id. l. c.*

Physomerus delineatus, p. 59, Singapore; *subargenteus*, Pulo Penang, *nigro-rufus*, N. Hindostan, p. 60; *mictiformis*, p. 61 [no locality]: *id. l. c.*

Archimerus muticus, p. 63, *acutiusculus*, *indecorus*, p. 64, *gutticentris*, *maculifer*, p. 65, *dolosus*, p. 66, Mexico: *id. l. c.*

Meropachys notatus, p. 70, Para: *id. l. c.*

Philippus asper, p. 71, Amazons: *id. l. c.*

Hirtilus tinctus, p. 72, *pallens*, p. 73, *pallidus*, p. 74, Amazons; *collaris*, p. 73, Mexico: *id. l. c.*

Nematopus ferrinus, p. 77 [no locality], *decoratus*, *varius*, p. 78, Amazons: *id. l. c.*

HOMÆOCERIDÆ.

Homæocerus (*Gonocerus*?) *abbreviatus*, H.-Schf. nec Fab., is renamed *umbratus*: Walker, *l. c.* iv. p. 93.

New genera and species:—

Leptornytus, *id. l. c.* p. 102. Next *Ornytus* and *Latimbus*. *L. ruficornis* [sic], *ibid.*, Amazons.

Homæoceroïdes, *id. l. c.* p. 103. *Homæocerus diversicornis*, Wlk., and *incongruus*, *ibid.*, Amazons.

Euplatycoris, *id. ibid.* *E. bellicornis*, *id. l. c.* p. 104, Santarem.

Paryphes gloriosus and *viridipes*, *id. l. c.* p. 88, Amazons.

Homæocerus plagiatus, p. 93, *sinicus*, p. 98, China; *clarus*, p. 94, Java; *turbidus*, p. 95, *subjectus*, *concisus*, p. 97, Siam; *signatus*, Ceylon, *lineatus*, Burmah, p. 97; *anticus*, p. 98, *minax*, p. 99, Hindostan; *mundus*, p. 99, *simplex*, p. 100, Sumatra; *lucidus*, *ib.*, Java; *parallelus*, *ibid.*, *parvulus*, p. 101, Sarawak, *id. l. c.*; *H. fasciatus*, p. 649, *bipustulatus*, *immaculatus*, p. 650, Stål, *l. c.*, Philippines.]

Dasynus pallidus, *nigripunctatus*, p. 651, *bucculentus*, p. 652, *id. l. c.*, same locality.

ANISOSCELIDÆ.

Anisoscelis orientalis, Dall., = *Leptoglossus membranaceus*, F.; *Lybas* and allies, forming a division "*Lybantina*," are characterized and tabulated: *id. l. c.* pp. 648 & 653 (note).

Uranocoris, g. n., Walker, *l. c.* p. 152. Next *Lybas*. *U. suavis*, sp. n., *id. l. c.* p. 153, New Guinea.

New species :—

- Anisoscelis santarema*, Santarem, *selecta*, St. Domingo, p. 127; *præcipua*, p. 128, *alata*, p. 129, Amazons; *concolor*, p. 128, Oajaca: *id. l. c.*
- Phthia concinna*, p. 132, Mexico: *id. l. c.*
- Leptoscelis varipes*, *venosa*, p. 133, *hypselonotoides*, p. 134, Amazons: *id. l. c.*
- Malvana rubescens*, p. 134, *centralis*, p. 135, Amazons: *id. l. c.*
- Sphictyrus smaragdinus*, p. 137, Archidona: *id. l. c.*
- Hypselonotus minax*, *luteiceps*, p. 139, *marginalis*, *ventralis*, p. 140, *signatus*, p. 141, *mundus*, *scutellaris*, p. 142, *fascicollis*, *crassifemur*, p. 143, Amazons; *lanceolatus*, p. 140, Cuenca; *pectoralis*, p. 141, Tunantins; *propinquus*, p. 142, *armatus*, p. 144, Mexico: *id. l. c.*
- Jadeca subvittata*, Amazons, *abdominalis* [no locality], p. 145: *id. l. c.*
- Serinctha antica*, p. 147, Celebes; *spurcata*, *fascicollis*, *ibid.*, *immunis*, p. 148, Mysol; *turbata*, p. 148, New Guinea: *id. l. c.*
- Cletus clarus*, p. 190, *mundus*, *subnotatus*, p. 191, C. G. Hope; *fuscescens*, p. 190, W. Africa; *signatus*, p. 194, *pallescens*, *inconspicuus*, p. 195, *conspicuus*, p. 198, Hindostan; *apicifer*, p. 195, Formosa; *anticus*, p. 196, *crassus*, p. 197, Aru; *fasciatus*, p. 196, Mysol; *alienus*, p. 199, New Guinea; *C. (P) indecorus*, p. 197, Flores; *inermis*, p. 198, Santarem: *id. l. c.*
- Cletomorpha denticulata*, Stål, *l. c.* p. 652, Philippines.
- Lybas turpis*, p. 150, Ceylon, *penicillatus*, *ibid.*, *lugubris*, p. 151, Singapore, *afflictus*, p. 151 [no locality], *mæstus*, Java, *fascipes*, New Guinea, p. 152, Walker, *l. c.*; *L. pallidicornis*, *obscuricornis*, p. 654, *punctipes*, *obscuripes*, p. 655, *maculipes*, *pictipes*, *dentifer*, p. 656, Stål, *l. c.*, Philippines.
- Lygæopharus maurus*, *id. l. c.* p. 653 (note), Moluccas.

ALYDIDÆ.

Stachyolobus, g. n., *id. l. c.* p. 658. Allied to *Mutusca*, but with longer and sharper jugæ, 1st joint of antennæ longer, scutellum spinose, apical angle of corium more produced, &c. *S. macilentus*, sp. n., *id. l. c.* p. 659, pl. vii. fig. 4, Philippines.

Typalus ferrugineus, sp. n., *id. l. c.* p. 657, Philippines, Java.

Marcus quinquespinus, sp. n., *id. ibid.*, Philippines.

Hyalymenus ichneumoniformis, sp. n., Walker, *l. c.* p. 156, Ega.

Alydus debilis, sp. n., *id. l. c.* p. 160, Santarem.

Camptopus decius, p. 165, C. G. Hope, *sordidus*, p. 167, Australia: *id. l. c.* spp. nn.

Dulichius (P) clavifer, sp. n., *id. l. c.* p. 170, New Guinea.

STENOCEPHALIDÆ.

Prionotylus helferi, Fieb., and ? *Myrmidius flavidus*, Costa, = *Chorosoma brevicorne*, Muls. & R., which should form a distinct genus: Puton, Mitth. schw. ent. Ges. iii. p. 425.

Stenocephalus medius, sp. n., Mulsant & Rey, Mém. Ac. Lyon, xviii. p. 432, Lyons.

Leptocoris discoidalis, p. 173, New Guinea, *biguttata*, p. 174, Gilolo: Walker, *l. c.*, spp. nn.

Noliphus annulipes, Celebes, *N. (?) ruficollis*, Singapore, *distinctus*, Sarawak, p. 176, *biplagiatus*, p. 177, Gilolo: *id. l. c.*, spp. nn.

COREIDÆ.

Verlusia sinuata, Muls. & R., *nec* Fieb., is renamed *reysi*; *Coreus hirtus* occurs in France: Puton, Ann. Soc. Ent. Fr. (5) i. p. 303 *et seq.*

Gonocerus strigatus, sp. n., Walker, *l. c.* p. 187, Rio Janeiro.

Ceratopachys subsparsus, sp. n., *id. l. c.* p. 105, S. Africa.

Camptischium tenebrosus, p. 114, *subvarium*, p. 116, Archidona, *sublave*, p. 115, Santarem, *verrucosum*, *ibid.*, Cuenca: *id. l. c.*, spp. nn.

Acanthocoris tarsalis, p. 117, Old Calabar, *anticus* (= *Crinocerus ponderosus*, Walker, List Ceyl. Ins.), p. 118, Ceylon: *id. l. c.*, spp. nn.

Dasycoris dorsalis, sp. n., Mulsant & Rey, *l. c.* p. 234, 332, France.

RHOPALIDÆ.

Maccevethus corsicus, Sign., = *errans*, F., ♂ var.: Puton, Mitth. schw. ent. Ges. iii. p. 425.

Corizus lepidus occurs in France: *id.* Ann. Soc. Ent. Fr. (5) i. p. 303.

Corizus (Rhopalus) magnicornis, Sign. (? F.), is named *signoreti*: Mulsant & Rey, *l. c.* p. 302, = *abutylon* (Fieb., Stål.), the *abutylon* of Muls. & Rey being *crassicornis* (Fieb.): Puton, *l. c.*

Corizus abutylon, Rossi, is recorded from Great Britain by Champion (Ent. M. M. vii. p. 208), and fully described by Douglas & Scott (*ibid.* viii. p. 23), who notice apparent errors in the references to it by Fieber & Stål of *C. magnicornis* and *crassicornis* as synonyms.

Corizus hyalinus, F. Stål, *l. c.* p. 659, notes individuals from the Philippine I., possibly of distinct specific value.

Colobatus, g. n., Mulsant & Rey, *l. c.* p. 321. Type *Corizus gracilis*, H.-S. (*truncatus*, Rambur, *sanguineus*, Costa, *siculus*, Signoret).

Corizus (Rhopalus) victoris, sp. n., *id. l. c.* p. 301, France (Var).

BERYTIDÆ.

REUTER, Öfv. Vet. Ak. xxvii. pp. 597-603, describes the Swedish species.

Neides depressus, Dougl. & S., = *parallelus*, Fieb.: Douglas & Scott, *l. c.* p. 62.

Berytus feberi, Dohrn (*Neides clavipes*, F. Sahlb.), = *minor*, H.-Schff.; and the description of *B. crassipes*, H.-S., probably refers to a brachypterous form: J. Sahlberg, Not. Fenn. xi. p. 283.

Berytus ferrarii, Garbigl., = *hirticornis*, Brullé, = *pilicornis*, Flor: Puton, Mitth. schw. ent. Ges. iii. p. 425.

Metatropis rufescens. Moncreaff, Ent. M. M. viii. p. 136, describes metamorphoses on *Circæa lutetiana*.

Berytus longicollis, p. 409, *gracilis*, p. 411, Provence, Mulsant & Rey, Mémoires. Ac. Lyon, xviii.; *B. pygmaeus* and *affinis*, Sweden, Reuter, *l. c.* p. 602: spp. nn.

PYRRHOCORIDÆ.

Dindymus sphaerocephalus, Burm., *fecialis* and *vinulus*, St., and *Ectatops seminiger*, St.: varr. from Philippines recorded by Stål, *l. c.* p. 665 *et seq.*

- Physopelta pilosa*, sp. n., *id. l. c.* p. 665, same locality.
Dindymus variabilis, sp. n., *id. l. c.* p. 666, same locality.
Ectatops fuscus, sp. n., *id. l. c.* p. 667, same locality.

LYGÆIDÆ.

VAN VOLLENHOVEN, Tijdschr. Ent. (2) v. pp. 263-302, pls. 10-12, commences descriptions of the Dutch species in the 3rd part of his 'Inlandsche Hemipteren,' discussing the genera *Lygæus*, *Pachymerus*, *Cymus*, *Heterogaster*, *Ophthalmicus*, and *Zosmenus*. He figures *Pachymerus abietis*, L., pl. 10. f. 1, *ferrugineus*, L., *ib. f. 2*, *rusticus*, Fall., *ib. f. 3*, *nubilus*, Fall., *ib. f. 6*, *hemipterus*, Schill., *ib. f. 8* (erroneously named *staphyliniformis*, Schill., in a former part), *sabulosus*, Schill., *ib. f. 4*, *rufipes*, Wolff, pl. 11. f. 7, *marginipunctatus*, Wolff, *ib. f. 4*, *chiragra*, F., pl. 12. f. 1, *varius*, Wolff, pl. 10. f. 6, *P. (Micropus, Sign.) decurtatus*, H.-Sch., *ib. f. 9 & 9a*, *P. pictus*, Schill., pl. 11. f. 5 & 5a, *quadratus*, F., *ib. f. 2*, *lynceus*, F., *ib. f. 3*, *pini*, L., *ib. f. 1 & 1a*, *agrestis*, Fall., pl. 10. f. 10, ♂ & ♀, *pratensis*, H.-Sch. (*nec* Pz.), pl. 11. f. 9, *contractus*, H.-Sch., *ib. f. 8*, *sylvaticus*, F., pl. 10. f. 5, *bidentulus*, H.-Sch., pl. 11. f. 10, *plebeius*, Fall., pl. 10. f. 7, *pusillus*, Scholtz, pl. 11. f. 11; *Heterogaster urticae*, F., pl. 12. f. 2; *Cymus resedæ*, Pz., *ib. f. 3*, *ericeæ*, Schill., *ib. f. 4*, *clavicornis*, Fall., *ib. f. 5*, *glandicolor*, Hahn, *ib. f. 6*; *Ophthalmicus grylloides*, L., *ib. f. 7*, *ater*, F., *ib. f. 8*; *Zosmenus capitatus*, Wolff, *ib. f. 9 & 9a*, *laportii*, Fieb., *ib. f. 10*. Some corrections of former lists are given.

Tetralaccus augur, St., and *marginatus*, Thunb., are to be referred to *Cænocoris*, Fieb.: Stål, *l. c.* p. 660.

Orsillus. Mulsant & Rey, Ann. Soc. L. Lyon, n. s. xviii. p. 203 (Opusc. Entom. xiv. p. 231), recharacterize this genus. Their own *Heterogaster depressa* is referred to it and redescribed, *O. depressus*, Dallas, being somewhat in doubt, and *Mecorampus maculatus*, Fieb., considered as probably confounding 3 species.

Nysius jacobææ, Schill. Puton (Mitth. schw. ent. Ges. iii. p. 425) suggests the confusion of 2 species under this name.

N. maculatus, Fieb., is redescribed and recorded from Great Britain by Douglas & Scott, Ent. M. M. viii. p. 27.

N. cymoides. Desmarts ('La Guienne,' 26 Nov., 1871) notes its ravages among vines.

Heterogaster salviae. Guyon's account of an enormous flight of this species at Batna in 1869 is recorded in R. Z. xxii. p. 198 *et seq.* (cf. Gazette Médicale de l'Algérie, 29 Nov., 1869, for a detailed description of the insect).

Ichnocoris flavipes, Sign., = *punctulatus*, Fieb.; and a Corsican var. of *hemipterus*, Sahlb., is named *nigricans*: Puton, *l. c.* p. 417.

Lasiomus enervis, H.-Sch., is redescribed and recorded from Great Britain by Douglas & Scott, *l. c.* p. 26.

Eremocoris erratica, usually occurring on juniper and pine, is recorded as living in companies under stones on the top of a Scotch mountain, far from its natural habitat, by White (Ent. M. M. viii. p. 98). Probably the insect's specific name was given to it from some such migrating propensity in it.

Pachymerus stabianus, Costa, = *Lasiocoris anomalus*, Kol.; *Rhyparochromus*

ghilianii, Garb., = *Beosus douglasi*, Fieb.; *Scolopostethus rubefactus*, Garbigl., = *Notochilus ferrugineus*, Muls., *ex typ.*: Puton, *l. c.* p. 425.

Pachymerus hemipterus, Flor (*nec* Schill.), = *Pterometus menetriesi*, Kouschakew, brachypt. form; *Pach. oculatus*, Flor, = *hemipterus*, Schill., and its macropterous form is described, p. 284; variations in the antennæ of *P. convivus*, Stål, are noted, and a macropt. form of *Trapezonotus nigripes*, Fieb., is described, p. 285; *Stenogaster falleni*, F. Sahlb., = *Oxycaenus modestus*, Fall., *ibid.*: J. Sahlberg, Not. Fenn. xi.

New species :—

Cænocoris sanguinarius and *inermipes*, Stål, *l. c.* p. 660, Philippine I.

Lygaeus saundersi, Mulsant & Rey, Ann. Soc. L. Lyon, n. s. xviii. p. 126 (Op. Ent. xiv. p. 225), Malaga; *L. (Oncopeltus) rubricatus*, Stål, *l. c.* p. 659, Philippine I.

Pachygrontha semperi, p. 661, *brevicornis*, *tabida*, *angusta*, *nigrovittata*, p. 662, *id. l. c.*, same locality.

Hyginus semperi and *consputus*, *id. l. c.* p. 663, same locality.

Colobathristes pectoralis, *pallidus*, *geniculatus*, *id. l. c.* p. 664, same locality.

Orsilius longirostris, p. 204 (Op. p. 232), Hyères, *planus*, p. 208 (Op. p. 233), Marseilles, Mulsant & Rey; *O. [script. Orsilius] reyi*, Puton, Pet. Nouv. p. 124 (diagnosis only), and Mitth. schw. ent. Ges. iii. p. 416, Hyères.

Plinthisus latus, Reuter, Not. Fenn. xi. p. 320, pl. 1. fig. 5, Finland.

Drymus latus, Douglas & Scott, *l. c.* p. 25, England.

Scolopostethus crassicornis, *id. l. c.* p. 24, England.

Notochilus danrui, Corsica, *limbatus*, Lille, *abeillii*, Ste. Baume, *gandolphii*, Bone: Puton, Pet. Nouv. p. 124 (diagnoses only), and Mitth. schw. ent. Ges. iii. pp. 418-420.

ANTHOCORIDÆ.

REUTER, in his "Skandinavien och Finlands Acanthiider beskrifne" (Efv. Vet. Ak. xxviii. pp. 403-429), follows Douglas & Scott and Puton (though without acknowledgment) in uniting Fieber's *Microphysæ*, *Acanthiidae*, *Anthocoridae*, and *Ceratocombidae*. The family thus constituted he names *Acanthiidae*, adopting those divisions as subfamilies, under the names *Ceratocombina*, *Acanthina*, *Anthocorina*, and *Microphysina*. The Scandinavian and Finnish genera and species of these groups are described, with copious synonymy, and at pp. 426-429 is a synonymic table of them. The same author (*ibid.* pp. 557 *et seq.*, pl. vii.), in "Acanthiidae Americanæ," characterizes and figures new genera and species of his subfamily *Anthocorina*, from America, redescribing a few others.

Anthocoris lugubris, Flor, = *Temnostethus pusillus*, II.-S.: J. Sahlberg, Not. Fenn. xi. p. 287.

Ceratocombus muscorum, Fall. Reuter, *l. c.* p. 325, pl. 1. figs. 7 a & b, describes and figures a macropterous form.

New genera and species :—

Dolichomerus, Reuter, *l. c.* p. 557. Closely allied to *Lyctocoris*, but with 1st joint of rostrum as long as, or longer than, the head, and 4-veined membrane. *D. elongatus* (fig. 1) and *stali*, p. 558, S. Carolina.

- Calliodis*, *id. l. c.* p. 558. *C. picturata*, p. 559, fig. 2, Brazil.
Solenonotus, *id. l. c.* p. 559. *S. (Anthocoris?) sulcifer*, Stål, fig. 3.
Poronotus, *id. l. c.* p. 561. *P. (Xylocoris) discifer* (fig. 4) and *constrictus*, Stål.
Lasiophilus, *id. l. c.* p. 562. *L. pallidulus*, *ibid.* fig. 5, S. Carolina.
Dilasia, *id. l. c.* p. 563. *D. fuscata*, *ibid.* fig. 6, Texas, S. Carolina.
Dasypterus, *id. l. c.* p. 564. *D. (Xylocoris) limbatellus*, Stål (fig. 7), *assimilis*, *l. c.*, Texas, S. Carolina.
Zopherocoris, *id. l. c.* p. 565. *Z. (Anthocoris) armatus*, Stål, fig. 8.
Macrotrachelia, *id. l. c.* p. 566. *M. (A.) nigronitens*, Stål, fig. 9.
Pseudophleps, Douglas & Scott, Ent. M. M. viii. p. 60. Allied to *Myrmecodobia*, but with shorter and stouter antennæ, basal cell Y-shaped, and nerves almost obsolete. *P. inconspicuus*, p. 61, south coast of England.
Lyctocoris fitchi, Reuter, *l. c.* p. 557, New York.
Piezostethus sordidus, Texas, Brazil, *binotatus*, S. Carolina, *id. l. c.* p. 560;
P. parvulus, *id. Not. Fenn.* xi. p. 321, Finland; *P. lativentris*, J. Sahlberg, *ibid.* p. 287, pl. 1. fig. 1, Carelia.
Scoloposcelis flavicornis, Reuter, *CEfr. Vet. Ak.* xxviii. p. 561, Texas.
Triphleps rugicollis (? = *Reduvius insidiosus*, Say, *sec. auct.*), Texas, *latulus*, New Jersey, p. 565: *id. l. c.*
Dipsocoris pusillimus, J. Sahlberg, *l. c.* p. 288, Carelia.

CAPSIDÆ.

Myrmecoris agilis, Sahlb. [? Gorski]. Stein (B. E. Z. xv. p. 42) mentions and refers to a figure (not given) of a winged ♂ from Spandau. [This notice is subsequently suppressed.]

Diplacus albionatus, Stål. A brachypterous form described by J. Sahlberg, *l. c.* p. 289, and figured, pl. 1. fig. 2 (*cf.* also p. 466, for observations on the relations of the genus *Myrmecophyes*, Oschanine, with this insect).

Miris dolabratus is noticed by Nowicki (Verh. z.-b. Wien, xxi. Beih. p. 52) as attacking *Chlorops teniopa*, Meig., a fly injurious to corn-plants.

M. longicornis, F. Sahlb. (*antennatus*, Flor, pt.), is redescribed under the name *Teratocoris flori*: J. Sahlberg, *l. c.* p. 290.

Teratocoris hyperboreus, J. Sahlb., var. *d.*, ♀. The author, *l. c.* p. 293, note, corrects an error of dimensions in his original description, and suggests that this insect may be entitled to specific value.

Campyloneura vitripennis, Say, a parasite upon "the leaf-hopper of the vine," is referred to and figured by Riley, iii. Rep. Ins. Mo. p. 137, figs. 58 & 59.

Tytthus geminus, Flor. To this a brachypterous form is doubtfully referred (with a suggestion as to its separate specific value) by J. Sahlberg, *l. c.* p. 295. *Capsus mutabilis*, F. Sahlb., = *Orthocephalus saltator*, Hahn, *id. ibid.*; and the ♂ of *Criocoris intermedius*, F. Sahlb., is described, *id. l. c.* p. 297.

Orthotylus pallidus, M.-Dür, redescribed by Puton (Mitth. schw. ent. Ges. iii. p. 421) from fully coloured individuals.

Acropelta pyri, Mella, = *Stethocomus mamillosus*, Flor; *Calocoris distinguendus*, Garb., = *fulvomaculatus*, Deg.; *C. rubidus*, Garb., = *Megacælum infusum*, H.-S.; *Capsus consanguineus*, Costa, = *Horistus rubrostriatus*, H.-S.; *C. montivagus*, Costa, = *Dioncus neglectus*, F.; *C. episcopalis*, Costa, = *punctum*,

Ramb. ; *C. mixticolor*, Costa, = *Megalodactylus macula-rubra*, M. & R. ; *C. scabricollis*, Costa, = *Brachyceræa globulifera*, Fall. ; *C. limbatus*, Perris, = *Litocoris ericetorum*, Fall. ; *C. tamarisci*, Perris, = *Psallus notatus*, Fieb., the former to stand, *Oncotylus tamarisci* taking the name of *hippophæes*, Meyer ; *Globiceps infuscatus*, Garb., = *Orthocephalus saltator* ♂ ; *O. nitidus*, Meyer, has both ♂ & ♀ apterous, and is in some respects generically near *Halticus* : Puton, l. c. pp. 425 & 426.

Psallus alni, D. & S., nec Fab., is renamed *alniicola* ; Douglas & Scott, l. c. p. 62.

New genera and species :—

Mermi[tho]merus, J. Sahlberg, l. c. p. 293. Intermediate between *Lopus* and *Horistus*, but distinguishable by the apical joint of the posterior pair of its tarsi being filiform, and more than twice the length of all the rest together. *Lopus cruciatus*, F. Sahlb.

Disphinctus, Stål, Öfv. Vet. Ak. xxvii. p. 668. Build of *Monalio* ; allied to *Pachypeltus*, but with slightly convex and unfurrowed scutellum. *D. ful-leni*, pl. vii. fig. 6, *sahlbergi*, *reuteri*, and *haglundii*, id. *ibid.*, Philippines.

Psilorhamphus, id. l. c. p. 669. Membrane with a single area, rostrum nearly reaching apex of abdomen &c. *P. conspersus*, *ibid.*, *consputus* and *albo-maculatus*, pl. vii. fig. 5, id. l. c. p. 670, same locality.

Hyalocephus, id. l. c. p. 670. Allied to *Macralonius* (type *Capsus sobrinus*). *Capsus vitripennis* and *pellucidus*, Stål.

Eurystylus, id. l. c. p. 671. Allied to *Atractotomus*. *E. costalis*, id. *ibid.*, Philippines.

Helopeltis pellucida and *collaris*, id. l. c. p. 667, same locality.

Teratocoris paludum, J. Sahlberg, l. c. p. 291, Carelia, Helsingfors (formed at the expense of *antennatus*, Flor).

Lygus innotatus, Reuter, Not. Fenn. xi. p. 322, Finland.

Tytthus flaveolus, id. l. c. p. 323, pl. 1. fig. 6, Finland (P = *insignis*, Dougl. & Scott, *forma brachyptera*, sec. auct.).

Conostethus salinus, J. Sahlberg, l. c. p. 296, pl. 1. figs. 3 & 4, shores of White Sea, Carelia.

Agalliaestes pullus, Reuter, l. c. p. 324, Finland.

TINGIDÆ.

Tingis. Douglas & Scott, l. c. p. 62, point out that Fabricius, in Syst. Rhynch., where this genus was characterized, considered its type to be *Cimex clavicornis*, Lin., and not *cardui*, F., as Stål avers.

ARADIDÆ.

STÅL, l. c. p. 671, characterizes a subfamily *Brachyrhynchina*, including his *Arictus* and *Artabanus* (recharacterized, p. 672), *Brachyrhynchus*, Lap. (restricted, p. 673), and *Neuroctenus*, Fieb. At p. 672, note, he gives characters of two other subfamilies, *Aradina* and *Isodermina*, and describes as new species from the Philippine Isles :—

Arictus tagalicus, p. 672.

Artabanus gemculatus, p. 673.

Brachyrhynchus nasutus, *ibid.*

Neuroctenus serrulatus and *mairi*, p. 674.

REDUVIIDÆ.

Nabis limbatus, Dahlb. Reuter, *l. c.* p. 325, describes a macropterous form.

Metapterus, Costa. Puton (Mitth. schw. ent. Ges. iii. p. 425), having received specimens from Corsica, recharacterizes this genus, which he had provisionally named *Neidosoma*, Costa's description omitting the important point of the mesonotum being covered by a prolongation of the pronotum. He names the species (*linearis*, Costa) *damrui*, considering that both his genus and species will stand if they prove not identical with Costa's insect—of which, however, there seems little doubt.

Pygolampis femorata, Costa, = *Ctenocnemis flavescens*, Fieb.: *id. ibid.*

STÅL, *l. c.*, briefly notes varr. of *Cosmocleptes pheniodes*, St., p. 676, *Rihirbus trochantericus*, St. (named respectively *niger*, *scutellaris*, *ruficeps*, *rufipennis*, *rufidorsis*, *tibialis*, *semiflavus*, *luctuosus*), p. 677, and of other Philippine species. According to him, *l. c.*, *Cydnocoris tagalicus*, St., = *gilvus*, Burm., var. *a*; *Cosmophodrus generosus*, St., = *Sycanus stali*, Dohrn; *S. pyrrholomus* and *cardinalis*, St., = *fulvicornis*, Dohrn, varr. *d* & *e*; *Pheimius tuberculiger* and *conso-brinus*, St., = *tibialis*, Westw.; *Reduvius frater* and *convivus*, St., and *Sphodronyttus erythromelas*, St., = *S. erythropterus*, Burm., varr. *c*, *e*, & *d*; *Pirates fuscicornis*, Dohrn, = *Ectomocoris atrox*, St.; *Durganda fuscipes*, St., = *rubra*, Am. & S.; *Epidaus transversus*, Burm., and *maculiger*, St., form a separate division of their genus, p. 679; and *Nalata plebeia* and *fuscicollis* constitute a new genus, p. 697. He describes the following new genera and species from the Philippine Islands:—

Lissoceptes, p. 676. Allied to *Pristhesancus*; differing in the structure of its thorax and the sides of its abdomen. *L. nitidus*, p. 677.

Campsolomus, p. 686. Allied to *Sphodronyttus*. *C. strumulosus*, p. 687, pl. vii. fig. 9.

Sphactes (and subg. n. *id.*), p. 687. *S. (S.) hemiochrus*, *S. (subg. n. Lisso-nyctes) politus*, p. 688, pl. vii. fig. 7.

Stachyomerus, p. 688. Allied to *Sphactes*, but with spinous legs, as in *Sineas*. *S. pallescens*, p. 689.

Lamprosphodrus, p. 689. Allied to *Velinus*. *L. nobilis*, p. 690.

Stachyogenys, p. 696. Allied to *Nalata*. *S. setipes*, p. 697.

Stachyotropha, p. 697. Allied to *Pnirontes*. *S. punctifera*, p. 698, pl. viii. fig. 13.

Campsocnemis, p. 698. Allied to *Stachyotropha*. *C. bipuncticollis*, p. 699, pl. viii. fig. 14.

Aulacogeia, p. 700. Almost of the size of *Rhyparoclopius*, but belonging to div. *Pygolampina*. *A. acutangula*, *ibid.* pl. vii. fig. 12, *corniculata*, p. 701.

Ischnobana, p. 703. Allied to *Ghilianella*. *I. macerrima*, pl. viii. figs. 15 & 15 a, and *dohrni*, *ibid.*

Arbela polita, p. 675.

Allcorhynchus pulchellus, *ibid.*

Veleda brevispina, *ibid.*

- Endochus histrionicus* and *varicolor*, p. 678.
Evagoras tagalicus, p. 679.
Cydnocoris asper and 2 varr., p. 680.
Sycanus semperi, p. 681, *gibber*, *cincticornis*, and *annulosus*, p. 682.
Hagia bituberculata, and 3 varr., p. 683.
Sphodronyttus inermis and *seminiger*, p. 685, *variabilis*, and 5 varr., and *histrionicus*, p. 686.
Tegea (subg. *Campylorhyncha*, *ibid.*) *femoralis*, p. 691, pl. vii. fig. 11.
Santosia senescens, *ibid.*
Ectomocoris flavomaculatus and *biguttulus*, p. 692.
Cleptocoris atromaculatus, *ibid.*
Spilodermus arcuatus, *ibid.* (? = *4-notatus*, sec. auct.).
Epirodera fuliginosa, p. 693.
Tiarodes cruentus, p. 694.
Sminthus geniculatus and *rufipes*, p. 695.
Velitra dichroa, *ibid.*
Acanthaspis quadriannulata and *inermis*, *ibid.*
Harpagochares luridus and *tagalicus*, p. 699.
Oncoccephalus nigrispinus, p. 701.
Saica longipes, *ibid.*
Stenolemus [? -*lenus*] *plumosus* and *crassirostris*, p. 702.
Gardena brevicollis, p. 704.

SALDIDÆ.

Salda littoralis and *flavipes*. Reuter (Not. Fenn. xi. pp. 325 & 326) gives diagnostic characters &c. for the macropterous and brachypterous forms.

Salda costalis, F. Sahlb., = *opacula*, Zett., and differences between Swedish and Carelian examples of *S. lateralis* and *pilosa*, Fall., are noticed by J. Sahlberg, *ibid.* pp. 302 & 303. Douglas & Scott (Ent. M. M. viii. p. 63), noticing Stål's reference of *costalis*, Sahlb., to *marginalis*, Fall., demur to his also quoting *marginella*, Fieb., as a synonym of that species, as they are not satisfied of its distinctness from *saltatoria*. The same authors give further characters for their *S. conspicua*, and (p. 28) redescribe *S. arenicola*, Scholtz, from a British example.

Salda fucicola, sp. n., J. Sahlberg, l. c. p. 301, White Sea, Carelia (? = *c-album*, Fieb., sec. auct.).

HYDROMETRIDÆ.

Halobates. M'Lachlan (Ent. M. M. vii. p. 208) summarizes Giglioli's account of the habits of this genus, and adds notes of his own experience.

J. SAHLBERG, l. c. p. 303, describes the larva of a subaquatic insect from Carelia, probably referable to a new genus, intermediate between *Hydrocessa* and *Velia*.

Hygrotrechus robustus, sp. n. (? Uhler), Packard, Am. J. Sci., Clear Lake, California.

Hydrometra vittata, sp. n., Stål, l. c. p. 705, Philippines.

Hydrobates vittipes, sp. n., *id. ibid.*, same locality.

NEPIDÆ.

Belostomides.

MAYR (Verh. z.-b. Wien, xxi. pp. 399-440) monographs this group, characterizing one new genus and 6 new species, and tabulating, by their larvæ and pupæ, such of the genera as are known to him in those stages. He depreciates Dufour's work on these insects. The following observations occur:—

Serphus, Stål (1862), apparently requires renaming, *Serphus* having been used by Schrank in 1780 and Haliday in 1832. *Stenosecytus mexicanus*, Mayr, = *Abedus ovatus*, Stål. *Belostoma testaceopallidum*, Latr., is possibly a *Zaittha*. *Z. indentata*, Hald., = *stolli*, Am. & S.; *stolli*, Mayr, = *carbonaria*, Duf., = *marginiguttata*, Duf.; *dentata*, Mayr, = *eunorpha*, Duf.; *stolli*, Duf., pt. = *boscii*, H.-S., Mayr, = *anurus*, H.-S., of which *cupreomicans*, Stål (*subspinosa*, Duf., ? *bifoveata*, Hald.), is a var.; *stolli*, Duf., pt. = *asiatica*, Mayr, for which *boops*, Duf., is to be used, the species not coming from Asia [!]; *reticulata*, Hald., = *testacea*, Leidy; a var. of *minor*, Duf., is named *cubensis*, p. 417; *maculosa*, *limbata*, *adusta*, *difficilis*, and ? *micantula*, Duf., = *plebeia*, Stål; doubt is thrown both upon the specific value and the Pondicherry locality of *pygmæa*, Duf. *Amorgius*, St., is not generically distinct from *Belostoma*; *B. medium* and *curtum*, Guér., are irre recognizable; *Lethocerus cordofanus*, Mayr, *Belostoma lutescens*, *indicum*, *bispinulosum*, *pruinolum*, Duf., and *patruiele*, St., = *niloticum*, St.; *ruficeps* and *signoreti*, Duf., = *annulipes*, H.-S.; *obscurum* and *litigiosum*, Duf., *impressum*, Hald., *grande*, var. *americanum*, Leidy, = *griseum*, Say; *distinctum* and *ruficeps*, var., Duf., *harpax*, St., and ? *angustatum*, Guér., = *Benacus haldemanus*, Leidy. *B. grande*, Luc., *algeriense*, Duf., *capitatum*, Guér., *Ilyotrephes herculeus*, Duf., *Hydrocyrius punctatus*, Stål, = *H. columbiæ*, Spin. *Borborotrephes hedenborgi*, St., = *Limnogiton fieberi*, Mayr. *Appasus*, Am. & S., and *Amyotella*, Spin., are possibly identical, the former having been wrongly confused with *Diplonychus* by Dufour; *A. japonicus*, Vuill., is probably to be referred to the latter genus; *A. natator*, Am. & S., *Diplonychus ægyptius*, H.-S., and *cænosus*, St., = *nepoides*, F.; *A. natator*, St., nec Am. & S., is renamed *capensis*, and *Dipl. luridus*, Germ., but for its locality, would seem referable to this species, instead of to *nepoides*. *Atomia*, Spin., = *Spherodema*, Lap., 1832; *Belostoma marginatum*, Gray, *S. rotundata*, Lap., = *annulata*, F. *Nervinops*, Duf., = *Diplonychus*, Am. & S. (nec Lap.); a var. of *molestus*, Duf., is named *subrhombus*, p. 437; *marginicollis*, Duf., is considered a var. of *rusticus*, F., with which *Nepa plana*, Sulz., is probably identical.

The following new genus and species are described:—

Nectocoris, p. 432. Allied to *Zaittha*, but with deep and backwardly converging interocular furrows, the lateral margins of pronotum straight and slightly dilated, the outer margin of hemelytra strongly arched and flattened, the membrane complete, but small, and the two claws of anterior tarsi not abbreviated. *N. stali*, *ibid.*, Rangoon.

Abedus signoreti, p. 404, Mexico and Guatemala; *vicinus*, p. 405, Mexico.

Zaittha elegans, p. 415, La Plata.

Belostoma aberrans, p. 424, India; *angustipes*, p. 427, Mexico.

Nepides.

Borborophyes, g. n., Stål, l. c. p. 706. Allied to *Telmatotrephus*. *B. mairi*, sp. n., *id.* l. c. p. 707, Philippines.

Laccotrephes robustus, sp. n., *id.* l. c. p. 706, same locality.

CORIXIDÆ.

"Ahuautlé." Deyrolle (Pet. Nouv. p. 165) refers, under this name, to the eggs of a *Corixa*, which are reduced to a flour and eaten, seasoned with pimento, by the Mexicans. He refers also to the means employed for collecting the eggs in sufficient bulk. For references to accounts by Virlet d'Aoust & Tylor of this practice, *cf.* Packard, Am. J. Sci.

Corixa hieroglyphica, Duf. Rogenhofer (Verh. z.-b. Wien, xxi. p. 65) gives particulars of enormous swarms of this species at Vienna, Baden, and elsewhere.

Corixa glauca, Garb., = *nigrilineata*, Fieb.: Puton, Mitth. schw. ent. Ges. iii. p. 425. *C. cognata*, Fieb., = *carinata*, Sahlb., *sec. typ.*: J. Sahlberg, Not. Fenn. xi. p. 307.

Corixa ovivora, Westwood, Pr. E. Soc. 1871, iv., S. Canara, Madras Presid. (destructive to the eggs of fishes); *C. decolor* (? Uhler), Packard, Am. J. Sci., Clear Lake, California; *C. lævipennis*, p. 304, *pallidula*, p. 306, J. Sahlberg, l. c., Carelia; *C. salina*, Puton, Pet. Nouv. p. 124 (diagnosis only), Mitth. l. c. p. 424, Calais: spp. nn.

HEMIPTERA HOMOPTERA.

SAHLBERG, JOHN. Æfversigt af Finlands och den Skandinaviska halföns Cicadariæ. Not. Fenn. xii. (n. s. 9) pp. 1-506, 2 pls.

Though restricted to the Scandinavian species, this careful revision (written for the most part in Latin) cannot fail to be of great use to the student of European *Homoptera*. It is to be regretted, however, that the author appears ignorant of many species described during the past few years in England. The plates are chiefly well executed diagrams of alar neurulation, and tables of the distribution of the different species in Finland, Sweden, and Norway. Various lists of species frequenting certain localities and plants are given, comparisons also being made with the homopterous faunas of Prussia, Livonia, Moscow, and Siberia. Many species and 5 genera are described as new; but the want of comparative diagnostic characters for the latter prevents their useful abstraction.

CICADIDÆ.

Huechys sanguinea, Am. & S., employed in China as a blistering agent: Porter Smith, Pharm. J. & Tr. (3) p. 4, from 'Medical Times and Gazette.'

Cicada hæmatodes, F., = *montana*, Scop., for which *Melampsalta*, Kol., is adopted, its characters being reproduced: J. Sahlberg, l. c. p. 77 *et seq.*; alar neurulation figured, *ibid.* pl. 1. f. 7.

Dundubia melpomene, Walk., = *Cosmopsaltria fuliginosa*, Walk., Stål, Æfv. Vet. Ak. xxvii. p. 708; and *Cosmopsaltria* is divided into 3 subgenera, *Platylomia* (type *Dundubia flavidula*, ? Guér.), *Cosmopsaltria* proper (type

spinosa, F.) and *Diceropyga* (type *oblecta*, F.): *id. ibid.*, note. The author also establishes a subgenus, *Oncotympana*, of his *Pomponia*, p. 710; subgenera of *Cicada* (*Chremistica*, type *viridis*, F., *Macrotristria* [*? vox hybrida*], type *angularis*, Germ., *Cicada* proper, type *plebeia*, Scop., and *Diceroprocta*, type *alaeris*, Stål), p. 714, note; and a subgenus, *Nelecynda*, of *Tibicen*, Latr., p. 716; and characterizes the following new genera and species from the Philippines:—

Psithyristrina [*? Psithyristes*], p. 712. Perhaps most allied to *Pomponia*, but very conspicuous, from the structure of the tegmina. *P. specularis*, *ibid.* pl. viii. fig. 16, *crassinervis*, fig. 18, *tenuinervis*, fig. 19, *simplicinervis*, fig. 20, p. 713.

Cosmopsaltria (*C.*) *inermis*, p. 708, *spatulata*, p. 709.

Pomponia (*Oncotympana*) *pallidiventris*, p. 710, pl. viii. fig. 21, *viridicincta*, p. 711, fig. 22.

Cicada (*Chremistica*) *tagalica*, p. 714, *semperi*, p. 715.

Tibicen (*Abroma*) *ferrarius* and *T. (Nelecynda) tener*, p. 716.

Melampsalta lævifrons, p. 717.

Prasia fatiloqua, p. 718.

CERCOPIDÆ.

Cercopides.

Cercopis costalis, Walker, = *theora*, White, = *Cosmoscarta proserpina*, White; according to Stål, l. c. p. 718, who, however, also states (l. c. p. 721, note) that *Cercopis hilaris*, Walker, = *costalis*, Walker, and that it belongs to *Phymatostetha*, g. n., allied to *Cosmoscarta* and *Cercopis*, with type *Cercopis mactans*, White, = *perspicillaris*, White, and also comprising *C. stellata*, Guér., *larinia*, St. (= *basiclava*, Wlk.), *pudens*, *signifera*, and *circumducta*, Wlk., and *Tomaspis semele*, *nympha*, and *cynthia*, St.

Pæciloterpa, g. n., *id. ibid.* Allied to *Literna*. *P. nigrilimbata*, sp. n., *id. l. c.* p. 722, Philippines.

Cosmoscarta rufipes, *sezmaculata*, *semimaculata*, p. 719, *nigritutata*, *carinata*, p. 720, Stål, l. c., Philippines: spp. nn.

Aphrophorides.

SCOTT, after some general observations (Ent. M. M. vii. pp. 240–243, 270–273), describes and revises the British species, first recording *Ptyelus campestris*, Fall., and *Lepyronia coleoptrata*, L., as such.

Aphrophora alni and *Philænus lineatus*. Alar neurulation figured by J. Sahlberg, l. c. pl. 1. figs. 9 & 10.

Peuceptyelus, g. n., *id. l. c.* p. 84. *P. (Cercopis) coriaceus*, Fall. (alar neurulation figured, pl. i. fig. 8).

Liorhina, g. n., Stål, l. c. p. 722. Allied to *Lepyronia* and *Plinia*, but with smooth frons &c. *L. reflexa*, sp. n., *id. ibid.* pl. ix. fig. 23, Philippine I.

Aphrophora maculipes, sp. n., *id. l. c.* p. 723, same locality.

Philænus aterrimus, p. 92, Oeland, *pulchellus*, p. 93, and *dilutus*, p. 94, Sweden: J. Sahlberg, l. c., spp. nn.

Perinoia latipes, sp. n., Stål, l. c., Philippines.

Clovio (*? g. n.*) *vitticeps*, p. 724, *sexfasciata*, *vittifrons*, p. 725, *philippina*, p. 726, *id. l. c.*, same locality: spp. nn.

Autonoe carinata, p. 726, *crassipes*, p. 727, *id. l. c.*, same locality: spp. nn.

CENTROTIDÆ.

Centrotus cornutus. Alar neurulation figured by J. Sahlberg, *l. c.* pl. i. fig. 11.

Lobocentrus, g. n., Stål, *l. c.* p. 727. Allied to *Leptobelus*, but posterior process of thorax lobed beneath, and the tegmina with 3 discoidal areas. *L. zonatus*, sp. n., *id. l. c.* p. 728, Philippines.

Cryptaspidia, g. n., *id. l. c.* p. 729. Nearest to *Gargara*, but with the post. process of thorax entirely covering the scutellum, and distinctly narrowed. *C. pubera* and *tagalica*, *ibid.*, *impressa* and *obtusiceps*, p. 730, *id. l. c.*, same locality: spp. nn.

Pyrgonota, g. n., *id. l. c.* p. 730. Allied to *Hypsauchenia*, but with wider post. process to thorax, and no dorsal lobe. *P. tumida* and *philippina*, *ibid.*, *bifurca* and *semperi*, p. 731, *id. l. c.*, same locality, spp. nn., and *Centrotus bifoliatus*, Westw.

Gargara varicolor and 3 varr., p. 728, *pulchripennis* and *nigrofasciata*, p. 729, *id. l. c.*, same locality: spp. nn.

IASSIDÆ.

Tettigonia kinbergi, St., ? = *unimaculata*, Sign.; *Palicus*, St., is to be referred to subfam. *Iassina*, as characterized, and *Cælidia sparsa*, St., to *Iassus*, under the name *consensus*, p. 735; *Hecalus afzeli*, St., belongs to *Glossocratus*, Fieb., p. 736; a subgenus, *Drabescus*, of *Selenocephalus*, Germ., is characterized; *Bythoscopus malayus*, St., = *Tartessus ferrugineus*, Walk., and varr. of it and of *T. fieberi*, St., are described, p. 738, and of *Tettigonia philippina*, Wlk., p. 733; *Macropsis*, Lew., should most probably be removed from the *Bythoscopina*, p. 740: Stål, *l. c.*

Pediopsis planicollis, Thoms., = *nassatus*, Germ.; *Cicadula orichalcea*, Dahlb., = *Notus flavipennis*, Zett.; *Typhlocyba flori*, Kirschb., = *N. molliculus*, Boh.; *T. citrinella*, Flor, nec Zett., is named *aridellus* (*Notus*); *T. suturalis*, Flor, = *gratiosa*, Boh.; *Iassus antennatus*, Flor, nec Boh., is named *flori* (*Limotettix*); *I. virescens*, Flor, Kirschb., Thoms., = *sulphurella* (*Limot.*), Zett.; *Iassus porrectus*, Thoms., ? = *Athysanus brevipennis*, Kirschb.; *I. punctifrons*, Germ., = *Graphocrærus ventralis*, Fall.; *I. distinguendus*, Flor, = *Deltocephalus pseudo-cellaris*, Flor; *D. costalis*, Fieb., = *punctum*, Flor; *I. productus*, Thoms., ? = *D. pusillus*, Kirschb.; *D. frigidus*, Boh., = *lividellus*, Zett.; *D. fuscisignatus*, Dahlb., and ? *luteolus*, Kirschb., = *pascuellus*, Fall.; *D. rufus*, J. Sahlb., = *abdominalis*, F., var.; *D. nigricans*, Kirschb., ? = *limbatellus*, Fieb.; *D. aridellus*, Boh., = *collinus*, Boh., macropt. form; *D. xanthoneurus*, Fieb., ? = *assimilis*, Fall.; *I. cephalotes*, H.-S., *D. assimilis* and *brachynotus*, Fieb., ? = *D. citrinellus*, Kirschb.; *Thamnotettix aliena*, Dahlb., ? = *D. breviceps*, Kirschb.; *D. bipunctipennis*, Boh., = *costalis*, Fall.; *Acocephalus confusus*, Kirschb., = *albifrons*, L.; *I. albiger*, Germ., = *A. serratulæ*, F.; *Ulopa macroptera*, Kirschb., = *reticulata*, F.: J. Sahlberg, *l. c.* p. 132 et seq. The author (pls. 1 & 2) figures the head of one of the *Iassina*, f. 1, the neurulation in *Thamnotettix*, f. 3, the genital segments of *Deltocephalus*, f. 4, and the alar neurulation of *Ledra aurita*, L., f. 12, *Tettigonia viridis*, L., f. 13, *Euacanthus interruptus*, L., f. 14, *Bathysmatophorus reuteri*, J. Sahlb., f. 15, *Macropsis lanio*, L., f. 16, *Pediopsis flavicollis*, L., f. 17, *Idiocerus lituratus*, Fall., f. 18, *Compsus elegantulus*, Z., f. 19, *Cicadula smaragdula*, Fall., f. 20, *Notus aridellus*, J. Sahlb., f. 21, *Typhlocyba 10-punctata*, Fall., f. 22,

Eupteryx urticæ, L., f. 23, *Erythria aureola*, Fall., f. 24, *Gnathodius punctatus*, Thunb., f. 25, *Coryphæus gyllenhali*, Fall., f. 26, *Thamnotettix simplex*, H.-S., f. 27, *Doratura stylata*, Boh., f. 28, *Deltoccephalus abdominalis*, L., f. 29, *Strongylocephalus agrestis*, Fall., f. 30, *Eupelix producta*, Germ., f. 31, *Ulopa reticulata*, F., f. 32, *Paropia scanica*, L., f. 33.

Tettigonia vitis, "the Thrips." Particulars of economy with figures, in i. Rep. Ins. Ont. p. 112.

Athysanus cinctus, Perris, = *Atractotypus bifasciatus*, Fieb.; *A. ornatus*, Perris, = *Phlepsius maculatus*, Fieb.: Puton, Mitth. schw. ent. Ges. iii. p. 425.

Iassus 6-notatus. Künstler (Verh. z.-b. Wien, xxi. Beih. p. 15) discusses injuries to cultivated plants from this species.

Ulopa reticulata. For observations on development, cf. J. Sahlberg, Not. Fenn. xi. p. 456.

U. trivialis is redescribed and recorded as British by Scott, Ent. M. M. vii. p. 272.

New genera and species:—

Bathysmatophorus. J. Sahlberg, l. c. xii. p. 109. *B. reuteri*, id. l. c. p. 111, Russian Lapland.

Limotettix, id. l. c. p. 224 (apparently = *Iassus*, H.-Sch., Flor, Krschb., Thoms.). Type *Cicada striola*, Fall., and 22 others, of which the following are new:—*L. longiventris*, p. 231, *lunulifrons*, p. 236, Carelia, *nigricornis*, p. 232, *binotata*, p. 242, Finland.

Doratura, id. l. c. p. 291 (*Athysanus* and *Iassus*, auctt., partim). *Athysanus stylatus*, Boh., and *homophylus*, Flor.

Tylissus, Stål, l. c. p. 739. Allied to *Tartessus*. *T. nitens*, id. *ibid.*, Philippines.

Petaloccephala punctatissima and *philippina*, id. l. c. p. 732, same locality.

Tettigonia impressipennis and *bipunctifrons*, p. 733, *subvirescens* and *quinque-notata*, p. 734, *nigrilinea*, p. 735: id. l. c., same locality.

Pediopsis carpini, p. 123, Sweden, *subangulatus*, p. 125, Yläne, *flavus*, p. 128, and *infuscatus*, p. 129, Carelia: J. Sahlberg, l. c.

Idiocerus crassipes, id. l. c. p. 143, Carelia.

Notus marginatus, p. 164, Carelia, *minimus*, p. 168, Sweden: id. l. c.

Typhlocyba erictorum, id. l. c. p. 185, Finland.

Deltoccephalus stali, p. 301, *scriptifrons*, p. 345, Finland, Russian Carelia; *bicuspidatus*, p. 307, Ladoga; *oculatus*, p. 308, Åbo; *paleaceus*, p. 316, Sweden, Norway; *paucinervis*, p. 318, Russian Carelia; *pæcilus*, p. 336, Finland (= *striatus*, var., Flor); *arenicola*, p. 343, Russian Lapland, Sweden: id. l. c.

Platymetopius cornutus, Oschanine, Nachr. Ges. Mosc. vi. pt. 3, p. 38, Moscow.

Athysanus 6-punctatus, p. 271, Strömstad (? = *Iassus pauperculus*, Thoms., sec. auct.), *discolor*, p. 277, Kexholm, *nauta*, p. 280, Russian Carelia, *lateralis*, p. 281, Stockholm: J. Sahlberg, l. c.

Iassus obscurus, p. 735, *philippinus*, p. 736, Stål, l. c., Philippines.

Hecalus (genus briefly recharacterized) *wallengreni*, p. 736, *flori*, *kirschbaumi*, and *thomsoni*, id. l. c., same locality.

Penthimia albigitula (and 2 varr.) and *reticulata*, p. 737, *reflexa*, p. 738, id. l. c., same locality.

Thanmotettix nigripicta, *id. l. c.* p. 740, same locality; *T. fulvipicta*, J. Sahlberg, *l. c.* p. 212, Finland.

Macropsis maculipennis, Stål, *l. c.* p. 740, Philippines.

FULGORIDÆ.

Varieties of *Aphana farinosa*, Web. (named *æruginea*), and *Scamandra lachesis* and *hermione*, St., are described from the Philippines, p. 742, with table of allied species, p. 743; *Serida*, Walk., = *Lophops*, Serv.; *Issus spectans*, Walk., = *Cibyra testudinaria*, St.; *I. acutus*, Walk., ? = *simplex*, Walk.; an amended tabulation of the genera with wings apically incised is given, p. 760, note; *Ricania malayana*, St., = *Flatoides perforatus*, Walk., = *F. tenebrosus*, Walk., = *Ricania speculum*, Walk.; *R. subfusca*, St., = *stupidus*, Walk.; and the following new subgenera are characterized:—*Scalabris*, of *Tylana*, St., p. 762, *Alisca* and *Plestia* (type *marginata*, Montr.), of *Armacia*, St., p. 768 and note; *Varcia* and *Sassula* (note, for *M. osmyloides*, Walk., and *sororcula*, St.), of *Miriza*, St., p. 769; *Cerfennia*, of *Flatoides*, Guér., p. 774; *Uxantis*, of *Atracis*, St., p. 775: Stål, *l. c.*

J. Sahlberg, *l. c.* pl. ii., figures the alar neururation of *Cixius cunicularius* (fig. 34), *Oliarus leporinus* (fig. 35), *Helicoptera lapponica*, Zett. (fig. 36), *Omatidiotus dissimilis*, Fall. (fig. 37), *Issus coleoptratus* (fig. 38), *Delphax minki*, Fieb. (fig. 39), and *Euides speciosa*, Boh. (fig. 40); and (pl. i.) gives outlines of the head and thorax of a Fulgorid (fig. 2), and of the genital segments of *Liburnia* (fig. 5) and *Euides* (fig. 6).

Fulgorides.

Luminosity of *Fulgora*. Perry's evidence is revived by Butler, Ent. M. M. viii. p. 167. Smith (Pr. E. Soc. 1871, p. vii) believes *Fulgora* to produce light, and adduces other records.

Fulgora philippina, p. 740, *æruginea* (? = *philippina*, ♀, *sec. auct.*), and *lauta* (? = *æruginea*, var., *sec. auct.*), p. 741: Stål, *l. c.*, Philippines, spp. nn.

Aphana rugulosa, sp. n., *id. l. c.* p. 742, same locality.

Scamandra lydia, sp. n., *id. l. c.* p. 743, same locality.

Dictyopharides.

Centromeria, g. n., *id. l. c.* p. 745. Nearest to *Dictyophara*, but with longer and more slender legs, and the anterior femora spined. *D. longipennis* and *speilinea*, Walk.

Dichoptera picticeps, p. 744, *signifrons* and *guttulosa*, p. 745, *id. l. c.*, Philippines: spp. nn.

Cixiides.

SCOTT (Ent. M. M. vii. pp. 190–193) completes his descriptive revision of the British species, recording *Cixius simplex*, H.-S., for the first time as such, and giving outlines of the ♂ genital segments of *C. stigmaticus*, Germ., *brachycranus* and *intermedius*, Scott, *nervosus*, L., *simplex*, H.-S., and *similis*, Kirschb. According to him, *C. musivus*, Marshall, = *stigmaticus*, Germ.; and *similis*, Kirschb., = *leporinus*, Marshall, but, though posterior, must be retained on account of Panzer's species of the latter name, with which Marshall's *leporinus* is not identical.

Mnemosyne philippina, sp. n., Stål, l. c. p. 746, Philippines.
Oliarus geniculatus, sp. n., *id. ibid.*, same locality.
Andes undulatus, sp. n., *id. l. c.* p. 747, Philippines and Borneo.
Benna rhyaroptera, sp. n., *id. ibid.*, Philippines.

Delphacides.

J. SAHLBERG, Not. Fenn. xii. p. 404 *et seq.*, gives the following synonymy, &c. :—

Delphax basilinea, Stål, Flor, and ? H.-S. (*nec* Germ., Krschb.), = *Euides speciosa*, F.; *D. smaragdula*, J. Sahlb. (*nec* St.), = *Chloriona unicolor*, H.-S.; *D. truncatipennis*, Boh., = *Megamelus notula*, Germ.; *D. longifrons*, Boh., = *minutus*, F.; *D. vittipennis*, J. Sahlb., = *guttuliferus*, Krschb.; *D. distincta*, Flor, Fieb., = *Liburnia albicarinata*, St.; *D. pallens*, St., Fieb., = *L. collina*, Boh.; *D. notula*, St., = *L. striatella*, Fall.; *D. dispar*, Fall., *hemiptera*, St., = *L. pellucida*, F.; *D. pellucida*, St., *nec* F., = *L. discolor*, Boh., *forma macr.*, *sec. typ.*; *D. hyalinipennis*, St., = *L. brevipennis*, Boh.; *D. tristis*, Boh., = *L. lepida*, Boh.; *D. signifera* and *palliat*a, Boh., = *L. limbata*, F.; *D. striatella*, St., = *Dicranotropis hamata*, Boh.; *Delphax fuscineris*, Boh., = *Ditropis (Achorotile) albisignata*, Dahlb.; *Delph. collaris*, St., *adelpha*, Flor., = *Ditropis mæsta*, Boh.; *Delphax mæsta*, Flor, Fieb., *nec* Boh., is named *borealis*; *D. nasalis* and *mutabilis*, Boh., = *Ditr. bicarinata*, H.-S.

SCOTT (l. c. pp. 193-196) completes his descriptive revision of the British species, recording *Liburnia pallidula*, Boh., and *Achorotile albisignata*, Dahlb., as such for the first time.

Calligypona [? *Callipygona*], g.n., J. Sahlberg, l. c. p. 408. *C. albicollis*, sp. n., *id. l. c.* p. 409, Småland.

Liburnia haglundii, p. 427, E. Gothland, *biarmica*, p. 430, *flavipennis*, p. 438, Russian Carelia, *cuttula*, p. 450, Helsingfors (? = *Delphax rhypara*, Flor, *sec. auct.*), *clypealis*, p. 454, Kexholm, *alpina*, p. 462, Lapland, *id. l. c.*; *L. extrusa*, Scott, l. c. p. 194, England: spp. nn.

Ditropis longicornis, sp. n., J. Sahlberg, l. c. p. 474, Russian Carelia.

Atropis lævifrons, sp. n., *id. l. c.* p. 484, Lenholm.

Hygiops pictifrons, p. 747, *impictus*, p. 748, Stål, l. c., Philippines: spp. nn.

Achilides.

STÅL, l. c., describes the following new genera and species in this and the 4 next subfamilies, from the Philippine Isles :—

Faventia guttulata, p. 748.

Tropiduchides.

Catulia, *ibid.* Near *Isporisa* and *Paricana*, but frons narrowed towards the inflexed apex, all of the costæ almost equally distant from the margin, and the antennæ longer. *C. subtestacea*, p. 749, pl. ix. fig. 26.

Taxila, p. 750. Very near *Tambinia*, but with frons angularly dilated towards apex, narrowed above the angles, and sides not parallel in middle. *granulata*, *ibid.* pl. ix. fig. 27.

Leusaba philippina, p. 749 (? = *marginalis*, Walk.).

Derbides.

Nebrissa, p. 751. Allied to *Thracia*, with wider vertex and frons, flattened antennæ, and tegmina much less thickly veined. *N. nitida*, *ibid.*

Thracia westwoodi, p. 751.

Lophopides.

Menosca, p. 752. Nearest to *Lacusa*, with longer vertex, produced before the eyes, a tricarinated and more angularly dilated frons, and much less dilated anterior legs. *M. discophora*, pl. ix. fig. 28, and *punctigera*, *ibid.*

Virgilia, p. 752. Apparently very near *Menosca*. *V. nigripicta*, p. 753.

Eurybrachides.

Frutis sanguineovittata, p. 753, *amplipennis*, p. 754.

Issides.

Issus dissimilis. For observations on development, *cf.* J. Sahlberg, Not. Fenn. xi. p. 456.

Stål, *l. c.*, redescibes the following new genera and species in this and the 2 following subfamilies, all but two from the Philippines:—

Augila, p. 754. Best placed near *Calliscelis*. *A. sulciceps*, p. 755, pl. ix. fig. 30.

Syrgis, p. 758. Very near *Eupilis* and *Tempsa*, but differing in the structure of the head and tegmina. *Issus simplex*, Walk.

Vindilis, p. 759. Allied to *Tetrica* and *Syrgis*, but very distinct from them in the structure of the head and tegmina. *V. fornicata*, p. 761.

Hemisphærius varicolor, *sexvittatus*, *variegatus*, p. 755, *nitidus*, p. 756.

Eupilis nigrinervis, p. 756.

Tetrica tricarinata, *nubila*, p. 757, *maculipennis*, *saucia* (? rightly placed in the genus), p. 758; *T. fusca*, p. 757, note, Birmah (type of genus).

Isthmia breviceps, sp. n., *id. l. c.* p. 761, Philippines.

Tylana (Scalabis) philippina and *tagalica*, p. 762.

Lollius australicus (type of genus), p. 763, note, Moreton Bay, *furcifer*, p. 762, *abdominalis*, p. 763.

Cyrene mucronata and *inermis*, p. 764.

Ricaniides.

Ricania fasciatifrons, *stygia*, p. 765, *tæniata*, p. 766, *melaleuca*, *signata*, p. 767, *sublobata*, *subsinnuata*, p. 768.

Armacia (Alisca) circumpicta, p. 769.

Miriza (Varcia) nigrivittata, *ibid.*

Mindura subfasciata and *maculipennis*, p. 770.

Flatides.

Siscia, p. 772. Differs from *Flata* in abnormal structure of head, and in deflexed and unkeeled sides of thorax. *S. nigrifrons*, p. 773.

Salurnis, p. 773. Near *Flata* and *Nephesa*, but with all or most of the longitudinal veins of the tegmina not furcate near apex, and the frons not keeled. *S. granulatus*, p. 774.

- Phromnia subguttata* (and 2 varr.) and *rubescens*, p. 771.
Copsyrna leucophæa, p. 772.
Flatoides (*Cerfennia*) *philippinus*, p. 775.
Atracis (*Uxantis*) *conspu*ta and *siccifolia*, p. 776.

PSYLLIDÆ.

MRYER-DÜR (Mitth. schw. ent. Ges. iii. pp. 377–406) gives an introductory sketch of the characters and affinities of this family, describing many new species. He gives a scheme of its genera (p. 380), and analytical tables of the recorded species of *Trioza* (p. 386), *Psylla* (p. 395), *Aphalara* (p. 401), *Euphyllura*, *Spanioneura*, and *Anisostrophæa* (p. 403), *Livilla*, *Livia*, and *Arytæna* (p. 404), *Rhinocola* (p. 405).

PUTON, Ann. Soc. Ent. Fr. (5) i. p. 437, gives the following synonymy in *Psylla*:—*P. heydeni*, Först., = *alni*, L., Flor, of which *fuscineris*, Först., is a var.; *rubra*, Goureau, *apiophila*, Först., = *pyri*, L., of which *pyricola*, Först., is a var.; *chlorogenes*, M.-Dür., = *sals[ci]cola*, Först., var.; *rubida*, M.-Dür., = *mali*, Först., var.; *pyrisuga*, Först., = *ferruginea*, Först., var.; *tor[os]ifrons*, Flor, = *spartiophila*, Först.; *insignis*, Flor, nec Först., is named *flori*; *terminalis*, M.-Dür., = *breviantennata*, Flor. The same author (p. 438) observes on the variation of habitat, and confirms the following:—*Psylla alpina*, Först., occurs on *Alnus viridis*; *P. pyrenæa*, Mink, on *Calycotome spinosa*; *P. spectabilis*, Flor, on *Spartium junceum*; *P. brevantennata*, Flor, on *Coniferæ*; *Spanioneura fonscolombii*, Först., on *Buxus*; *Livia erefeldensis*, Mink, on *Juniperus oxycedrus*; and *Livia junceorum* more often on Conifers than reeds.

Psylla pyri. Künstler (Verh. z.-b. Wien, xxi. Beih. p. 67) discusses injuries to cultivated plants from this species.

Psylla (*Rhinocola*) *speciosa* punctures poplar-leaves, which thereupon acquire the size and form of a cucumber: Lichtenstein, Ann. Soc. Ent. Fr. (5) i. Bull. p. lxxix; Pet. Nouv. p. 165.

Trioza flavipennis. Loew (Verh. z.-b. Wien, xxi. pp. 843–846), in Zoologische Notizen (3), records the metamorphoses and economy of this species, found in *Lactuca muralis*.

Psylla limbata, *terminalis*, p. 392, *ornata*, *similis*, *rubida*, *oxyacanthæ*, p. 393, *rufitarsis*, *nobilis*, *rutila*, *abdominalis*, p. 394, Switzerland, M.-Dür, l. c.; *P. rhododendri*, Puton, Pet. Nouv. p. 165 (diagnosis only), and l. c. p. 436, Engelberg, Switzerland, on *Rhododendron*: spp. nn.

Trioza argyrea, *færsteri*, *saundersi*, p. 390, *bicolor*, *helvetina*, *distincta*, p. 391, *juniperi*, p. 392, Switzerland: M.-Dür, l. c., spp. nn.

Aphalara pilosa, sp. n., Oschaniné, Nachr. Ges. Mosc. vi. p. 46, Moscow.

Rhinocola tamaricis, sp. n., Puton, ll. cc., Agde, on Tamarisk.

APHIDIDÆ.

BALBIANI, Ann. Sc. Nat. (5) xiv. Articles 2 & 9, pls. 18 & 19, xv. Art. 4, enters very minutely into the question of the generation of the oviparous *Aphides*, starting from the earliest microscopically perceptible trace, and including the development and structure of the genital organs, and all the embryonic phenomena. The plates (one of which is coloured) are excellent.

It is impossible here to abstract this elaborate work—the author's summary being divided into 22 heads, and occupying five pages.

DERBES (*ibid.* xv. Art. 8, pl. 3. figs. 1 & 2) supplements his former account of certain *Aphides* observed in galls on *Pistacia terebinthus*, attributed by Passerini to *Pemphigus*, and originally considered to belong to 5 different species by the author, who had observed 3 generations of each. He now refers them all to one species, and gives particulars of their economy and physiology, figuring both sexes, with details. He notes that of the 5 recorded generations, not one resembled any of the others—that only one generation was the result of the connexion of individuals of perfectly distinct sexes, one egg being the result, which remains in the body of the ♀, who dies and still envelopes it until it hatches—and that this connexion does not occur between individuals with wings, but of the ordinary larval form.

PASSERINI (Bull. Ent. Ital. iii. pp. 144–160, 244–260, 333–346) enumerates, alphabetically, the various Italian plants affected by *Aphides*, attributing to each their peculiar species.

On migration of *Aphides*, cf. Walker, Ent. v. p. 354.

Aphis. Künstler (Verh. z.-b. Wien, xxi. Beih. p. 8) discusses injuries to cultivated plants from members of this genus, especially noticing *Phylloxera vastatrix* (p. 85) and *Schizoneura lanigera* (p. 67).

Aphis mali and *Eriosoma (Pemphigus) pyri*, “the Apple-tree Plant-louse.” For particulars of economy and parasites, with figures, cf. i. Rep. Ins. Ont. pp. 77 & 78, and p. 69.

Pemphigus vitifoliæ, “the Grape-leaf Gall-louse.” For particulars of economy, with figure of infested leaf, cf. *ibid.* p. 113.

Periphyllus testudo, v. d. Hoev., and *P. laricæ*, Hal. Ritsema, Tijdschr. Ent. (2) vi. p. 147, refers to the differences of these insects, and suggests that the latter has the same relationship to *Aphis (Lachnus) laricis*, Walk., as the former to *A. (Chaetophorus) aceris*, viz. that of a larva-form.

Phylloxera vitifoliæ, Fitch. Riley (iii. Rep. Ins. Mo. pp. 84–96, figs. 39 & 40), in a treatise on “the Grape-leaf Gall-louse,” refers the European *P. vastatrix* to this species as a synonym, or at most a variety, considering that it was introduced from America. He enters at some length upon its economy, agreeing with Lichtenstein as to its being the cause of the vine-disease usually attributed to it; and especially criticizes Shimer's proposed family, *Dactylosphaeridæ* (cf. also i. Rep. Ins. Ont. p. 114, on the American *Phylloxera*).

Phylloxera vastatrix. Signoret, Ann. Soc. Ent. Fr. (5) i. Bull. p. xiii, has kept specimens alive for more than 6 months in an hermetically-sealed tube, and notes a fresh generation of them (*l. c.* p. xxv.) in it. He also records Riley's communication that in America the species that lives on leaves in the summer takes to the roots in winter.

LICHTENSTEIN (*ibid.* p. xlvii *et seq.*) discusses in detail the ravages of this species in the south of France. He thinks he has detected the ♂, and, in suggesting means of destruction for the insect, infers, from the observations of Laliman & Riley in America, that as in that country *Vitis vinifera* is attacked in the roots, *V. cordifolia* in the leaves, and *V. labrusca* in neither, it might

be effectual if the infested vineyards were restocked with the last plant, on which the vine of the country might afterwards be grafted. He comments (p. lxxviii) further upon these observations, adding Riley's statement that *V. vinifera* is always destroyed in U. S. A. by *Phylloxera*, but that it prospers in California, where the *Aphis* does not occur.

SIGNORET (*ibid.* p. lxxx) quotes Pellicot's opinion that the vine-disease is not caused by *Phylloxera*. He doubts whether the ♂ has been detected, and also whether the American vines would not in their younger state be liable to attacks of *Phylloxera*, supposing the insect to cause the damage.

PLANCHON & LICHTENSTEIN publish a small pamphlet (Montpellier: 1871, 8vo) on the *Phylloxera* of the vine in England and Ireland.

DESMARTIS ('Le Mouvement,' 22 Aug., 1871, and 'La Guienne,' 1 Oct., 1871) publishes some observations on *Phylloxera*. Planchon (C. R. lxxiii. p. 783), Faucon (*ibid.* p. 784), and Bossin & Baudet (*ibid.* p. 1159) respectively suggest phenic acid, submersion, trenches filled with carbon, and naphthaline as agents for stopping its ravages.

GIRAUD, Ann. Soc. Ent. Fr. (4) i. Bull. p. li *et seq.*, communicates and comments upon a note from Desmartis, describing an apparently new and widely spread disease of the vine, consisting of a gall-like growth, commencing near the roots, and which he dubiously refers to the injuries attributed to the *Phylloxera*, remarking that somewhat similar vegetable parasites occur on *Rhododendrum hirsutum* and *Azalea procumbens*. SIGNORET (*ibid.* p. lxxxi) is inclined to refer this disease to a vegetable cause [*cf.* Schnetzler, Bibl. Univ. xl. p. 18]. Cf. also DESMARTIS, 'La Guienne,' 6 Dec., 1871.

COCCIDÆ.

SIGNORET, Ann. Soc. Ent. Fr. (5) i. pp. 421-434, in the 8th part of his "Essai sur les Cochenilles," continues his notices of the *Lecanides*, treating, first, such of them as are enclosed in sheaths or sacks, formed of cottony filaments, viz. *Signoretia*, Targ. (type *S. clypeata*, Targ., = *C. luzula*, Duf., described p. 427, pl. vi. f. 1), *Eriopeltis*, Sign. (type *C. festuca*, Fonsc., described p. 430, pl. vi. f. 3-3f), *Philippia*, Targ. (type *P. follicularis*, Targ., = *Coccus oleæ*, Costa, described p. 433, pl. 6. f. 2-2b). These only are discussed at length; but the author indicates his intention of treating in like manner such species as are covered with a more or less thick coating of waxy matter, simulating the carapace of a tortoise or an *Asteria*, viz. *Vinsonia*, Sign. (*V. pulchella*), and *Ceroplastes* (*C. psidii* and *caricæ*, F., for which the author cannot admit the generic separation proposed by Targioni-Tozzetti). After these will come such species as are naked, or present a mere assemblage of cottony matter, viz. *Pulvinaria*, Targ. (*Lec. vitis*, auctt., the *gasteralpha* of Icery), *Lecanium*, auctt. (in the treatment of which the author materially differs from Targioni-Tozzetti, rejecting his *Physokermes*), *Ericerus*, Guér., and *Lecanopsis*. After these, in the present state of his knowledge, the author proposes to place *Kermes*, according to his own views, and not those of Tozzetti (*K. vermilio*, Planchon, *bauhinii*, *fuscus*, *gibber*, Dalm., &c.), which he considers to commence the *Coccides*, as it is not to be reconciled with the *Lecanides*,—to be followed by *Nidularia*. According to him, *Eriococcus*, Targ., contains both *Lecanides* and *Coccides*, and he retains the name for the latter subfamily. He also considers *Kermes emerici*, Targ., to be undistinguishable from *Lecanium*.

blanchardi. In discussing *Eriopeltis festucae*, the author gives some interesting details of the different conditions of the adult, in which the antennæ and legs are subject to atrophy (pl. vi. figs. 3e & 3f).

In Pharm. J. & Tr. (3) p. 268 *et seq.*, is an account of the rearing of the cochineal insect in the Canary Islands.

"Chinese wax." Cooper (in 'Travels of a Pioneer in Commerce' &c., 1871) believes this to be secreted by a *Coccus* (P. *C. ceriferus*, F.). He gives an account of its mode of production &c. For observations by Silliman, see Am. Nat. v. p. 683.

Coccus cacti and *vitis*: figures and notice of economy, in Ent. v. p. 327.

Coccus persicæ and *vitis*. Injuries to cultivated plants discussed by Künstler, Verh. z.-b. Wien, xxi. Beih. pp. 68 & 87.

Westwood (Pr. E. Soc. 1871, p. iii) briefly describes (and provisionally names *stellifer*) a *Coccus* infesting *Cypripedium niveum* in Siam.

Stainton (*ibid.*) remarks upon injuries to lemons from Palermo caused by a *Coccus* distinct from the species affecting oranges.

Chlamydococcus nivalis, A. Br., found in Styria by Strauss (Verh. z.-b. Wien, xxi. p. 81).

Aspidiotus conchiformis, Gmél., "the Oyster-shell Bark-louse." For particulars of economy &c., and figures, cf. i. Rep. Ins. Ont. p. 73.

(ANOPLURA.)

PEDICULIDÆ.

Cutting (Arch. Tr. Orl. Soc. i. p. 105 *et seq.*) gives a popular outline of the structure and habits of the members of this group.

GIEBEL (Z. ges. Naturw. xxxvii. pp. 173-179), in his "Analytische Uebersicht der Säugethierläuse *Hæmatopinus* und *Trichodectes*," gives a list of *Mammalia* upon which the species referred to are parasitic. Pp. 177-179 refer to the former genus. The author proposes the generic name *Echinophthirius* for his *H. setosus*, found on *Phoca vitulina*, which alone appears capable of separation from the others. The tables &c. appear to be extracted from the author's promised monograph of *Epizoa*.

Pediculus (*Goniodes*) *falcicornis*, Nitzsch. Dunning (Pr. E. Soc. 1871, p. vii) refers to the identity of *P. pavonis*, L., with this species.

Maddox (M. Micr. J. vi. pp. 144-149, pl. xevi.) describes and figures, with details, hexapod parasites found on the head of *Vespertilio pipistrellus*, either referable to the *Pediculina* or to a larval form of *Psoreptes*.

Idolocoris (Walker, MS.), g. n., Richter, Sci. Goss. 1871, pp. 131 & 211. The author states that this is the type of a new family next the *Acanthiida*, forming "the extreme limit of the *Hemiptera*, and perhaps links will be found to connect it with some of the Eproboscideous *Diptera*." *E. elephantis*, sp. n., *id. l. c.* p. 132, fig. 67, parasitic upon the elephant in Ceylon. Denny (jun.), *ibid.* p. 185, states it to be intermediate "between the *Pulicidæ* and *Cimicidæ*." Buchanan White, *ibid.* p. 234, renames the genus *Phantasmocoris* (*Idolocoris* being preoccupied by Douglas & Scott, 1865); and, finally, *ibid.* p. 278, the insect is stated to be the *Hæmatomyzus elephantis* of Pinget (1869), who associates it with *Hæmatopinus* (*Rhynchota*) and *Docophorus* (*Mallophaga*).

VERMES

BY

W. F. KIRBY, M.E.S. &c.

BARTSCH, S. Die Räderthiere und ihre bei Tübingen beobachteten Arten. Württ. JH. xxvi. pp. 307–364 (also separate, Stuttgart: 1870. 8vo, pp. 61).

Known to the Recorder by an abstract in Ann. N. H. (4) vii. pp. 304 & 305, and a short notice in Term. Közl. 1871, p. 47.

EHLERS, E. Ueber die auf der von Heuglin-Waldburg'schen Expedition nach Spitzbergen gesammelten Würmer. SB. Soc. Erlang. 1871, pp. 77–86 [translated Ann. N. H. (4) viii. pp. 53–61].

The author enumerates *Polychæta*, 21 spp.; *Gephyrea*, 2 spp.; *Nemertina*, 3 spp. Besides 4 new spp., he notices in detail or describes *Antinoe sarsi*, Kbg.; *Scione lobata*, Mlg.; *Potamilla*, sp.; *Phascolosoma arstedti*, Kef., and *Halicryptus spinulosus*, v. Sieb. *Mysta barbata* is new to the arctic fauna.

JÁNOS, K. Az Állatok Szaporodása. Term. Közl. 1871, pp. 305–319, 353–362.

Several common species of *Vermes*, *Coelenterata*, &c. are noticed and figured in this paper.

——. Arztaiközösség (Commensalismus). *L. c.* pp. 56 & 57.

Relates to *Holothuria*, *Euplectella*, *Nereis*, *Crinoidea*, &c.

KOWALEVSKI, A. Embryologische Studien an Würmern und Arthropoden. Mém. Pétersb. xvi. (no. 12) pp. 70, 12 plates.

An account of researches into the early development of *Sagitta*, *Euaves*, and *Lumbricus*. A few remarks on *Nephelis* and *Clepsine* occur also in the introduction. The germinal layers of the embryo are discussed as to their formation and destination, and are compared with those of Insects and Ascidians, to which they are very similar.

SCHMARDA, L. K. Zoologie (i.). Wien: 1871, 8vo, pp. x & 372, woodcuts.

The first volume is introductory, discussing Matter, Formed Material, 1871. [VOL. VIII.]

Animal Psychology, and Geographical Distribution, and the classification of the groups *Sarcodes* [*Protozoa*], *Cœlenterata*, *Echinodermata*, and *Vermes*.

The characters of the groups are very fully given; and many described as well as apparently new species are figured. His arrangement of the *Vermes* (pp. 263-372) is as follows (many of his groups appearing to be new):—

TURBELLARIA.

DENDROCELA: *Acerida*, *Pseudocerida*, *Prosthecerida*, *Notocerida*, *Carenota*, *Planariida*.

RHABDOCELA: *Microstomida*, *Pharyngea* (*Acmostomida*, *Stenostomida*, *Derostomida*, *Mesopharyngida*, *Opisthostomida*), *Apharyngea* (*Rhochmostomida*, *Gyrostomida*), *Rhynchoproboli*, *Catenulida*.

NEMERTIDEA: *Holocephala*, *Lobocephala*, *Monorhæga*, *Dirhæga*, *Tetrarhæga*.

Genus inc. sed. *Balanoglossus*.

COTYLIDEA.

CESTOIDEA: *Teniida*, *Dibothrida*, *Diphyllida*, *Tetraphyllida* (*Phyllobothrina*, *Phyllacanthina*, *Phyllorhynchina*), *Ligulida*, *Caryophyllida*.

DIGENEA.

TREMATODA: *Monostomida*, *Amphistomida*, *Distomida*.

MONOGENEA: *Tristomida*, *Udonellida*, *Polystomida*, *Octocotylida*, *Gyrodactylida*.

Genus inc. sed. *Myzostoma*.

HIRUDINEA: *Malacobdellida*, *Acanthobdellida*, *Histriobdellida*, *Branchiobdellida*, *Clepsinida*, *Hirudinida*.

NEMATELMIA.

GREGARINÆ: *Monocystida*, *Gregarinida*, *Didymophyida*, *Acanthophora*.

ACANTHOCEPHALI.

GORDIACI: *Sphæricularida*, *Gordiida*, *Mermecida*.

CHÆTOGNATHI.

NEMATODES. (A) **HYPOPHALLI:** *Urolabea*, *Anguillulida*, *Hedrerida*, *Phylosalopterida*, *Cheiracanthida*, *Ascarida*, *Filarida*, *Cephalota*, *Dacnudinæ*, *Spirurida*. (B) **ACROPHALLI:** *Trichotrachelida*, *Strongylida*.

Genera inc. sed. *Cystoopsis*, *Desmoscolex*, *Rhabdophora*.

ROTATORIA.

HOLOTRICHA: *Ptygurida*, *Æcistida*.

SCHIZOTROCHA: *Megalotrochida*, *Floscularida*, *Hydatinida*, *Euchlamida*.

ZYGOTROCHA: *Philodinida*, *Brachionida*, *Perosotrocha*.

GEPHYREA.

INERMIA: *Sipunculida*, *Aspidosiphonida*, *Priapulida*.

ARMATA: *Echiurida*, *Sternaspida*.

Genus inc. sed. *Chætoderma*.

CHÆTOPODA.

ABRANCHIATA: *Ichthyidida*, *Naidæ*, *Enchytræida*, *Tubificida*, *Lumbricida*, *Polyophtalmida*, *Maldania*, *Chætopterida*.

CEPHALOBRANCHIATA: *Pherusida*, *Hermellida*, *Terebellida*, *Pectinarida*, *Sabellida*, *Serpulida*.

NOTOBRANCHIATA: *Thelethusa*, *Ophelida*, *Ariciida*, *Cirratulida*, *Nerinida*, *Leucoderida*, *Syllida*, *Hesionida*, *Phyllodocida*, *Nephtyida*, *Glycerida*, *Nereida*, *Lumbrinerida*, *Eunicida*, *Amphinomida*, *Aphroditida*, *Palmyrida*.

GYMNOCOPE: *Tomopterida*.

ONYCHOPHORA: *Peripatida*.

Genus inc. sed. *Polygordius*.

W. C. MCINTOSH enumerates 48 species of Annelids as obtained by dredging off the coasts of Northumberland and Durham. Tr. North. Durh. iv. pp. 118-120.

A. METZGER enumerates 29 *Chaetopoda*, 3 *Hirudini*, 4 *Trematoda*, 5 *Nematoda*, and 1 *Gephyrea* as occurring off the coasts of E. Friesland. JB. Ges. Hannov. xx. pp. 33, 34.

Arctic species met with during the 'Porcupine' cruise of 1870 between the British Channel and Tunis: *Thelepus circinatus*, *Pista cristata*, *Trophonia glauca*, *Terebellides stræmi*, *Praxilla gracilis*, *P. prætermissa*, and *Glycera capitata*. Carpenter & Jeffreys, P. R. Soc. xix. pp. 153-175.

On *Lumbricida*, *Hydroida*, &c. dredged in Lake Superior, cf. S. J. Smith, Am. J. Sci. (3) ii. p. 374.

On a remarkable undetermined Annelid from Gourock, cf. D. Robertson, P. N. H. Soc. Glasg. i. p. 9.

P. J. VAN BENEDEN enumerates the worms and other parasites which have been recorded as infesting the various species of *Cetacea*. These are generally *Echinorhynchi*; and cestoid worms in the intestines are very rare, if, indeed, they occur at all. Bull. Ac. Belg. xxix. pp. 347-368.

Echinorhynchus pellucidus and *Phyllobothrium delphini* were the only parasites known to infest the dolphins; but a *Delphinus delphis* recently dissected at the Paris Museum contained *Phyllobothrium*, *Ascaris simplex* (known to infest the porpoise), *Trichosoma* sp. n., *Distoma* sp., and a remarkable new genus and species. *Phyllobothrium* is at present the only parasite known to infest *D. tursio*. H. Gervais, C. R. lxxi. pp. 779-781. For abstract, cf. Ann. N. H. (4) vii. p. 392.

Monostomum foliaceum and *Cyathocephalus truncatus*. On their anatomy, cf. O. Grimm, Z. wiss. Zool. xxi. pp. 499-504. *M. foliaceum*, though rightly placed with the *Trematoda*, is a transitional form with much affinity to the *Cestoidæa*. If the species should be placed in a new genus, Grimm proposes the name *Aridmostomum* instead of *Amphilina*, Wagener. *C. truncatus* appears to belong to the *Bothriocephali*, but to form a transition to the *Nematoda*. He proposes to alter the name *Cyathocephalus* to *Monobothrium* [but gives no reason for supplanting the accepted generic name of either species].

The recent works of Ehlers, Claparède, and Malmgren on *Vermes* noticed by E. Grube, SB. schles. Ges. xlvii. pp. 48-50.

Some of the more interesting *Annelida* of the Channel Islands, &c., are noticed by W. C. McIntosh, who remarks specially on *Prosorhochmus claparèdii*, Kef., and *Polyneæ areolata*. P. R. Soc. Edinb. vii. pp. 438-441.

CHÆTOPODA.

Claparède's 'Annélides Chétopodes du Golfe de Naples (Supplément)' is reviewed by A. Agassiz, Am. J. Sc. (3) ii. pp. 61 & 62.

Malmgren's "Annulata Polychæta Spetsbergiæ," &c. (cf. Zool. Rec. iv. pp. 624 & 625), originally appeared in Œfv. Vet. Ak. 1867, pp. 127-235, pls. 2-15.

On some *Annelida polychæta* observed in the Bay of Kiel, cf. Willemoes-Suhm, Z. wiss. Zool. xxi. pp. 387-395, and plates 31-33, *partim*. He more particularly describes the development of *Eteone pusilla*, *Terebellides stræmi*, and *Spirorbis nautiloides* [cf. Ann. N. II. (4) viii. pp. 139 & 140], and notices some unknown larvæ from Hellebaek and Spezzia.

Nereis. Authors are undecided whether to regard *Heteroneis* and *Nereilepus* as genera, groups, or merely polymorphous forms of *Nereis*. The last view is the most probable. Cf. Grube, JB. schles. Ges. xlvii. pp. 52-54, who reviews recent opinions and observations on the group.

Clumene lumbricalis, W. Scotland, *Terebellides stræmi* and *Onuphis eschrichti*, Firth of Clyde, are new to Britain. D. Robertson, P. N. H. Soc. Glasg. i. pp. 82-85.

Glycera. Grube ("Bemerkungen über die Familie der Glycereen," JB. schles. Ges. xlvii. pp. 56-68) remarks on this genus and its allies, and describes many new species. He gives a table and short descriptions of all the known species. *G. branchiata* and *G. albicans*, Qf., ? = *G. convoluta*, Kef.; *G. muelleri*, Qf., ? = *G. capitata*, Œrsd. The following species are insufficiently described:—*G. carnea*, Bl.; *corrugata*, Baird; *kraussi* and *viridescens*, Stimps.; *lancadivæ* and *sphyrabranchea*, Schm.; *vitis* and *nigripes* (= *Nereis hirsuta*, Daly?), Johnst.; and *polygona*, Risso.

On a *Siphonostoma* occurring in the Bay of Rothesay, cf. J. Grieve, P. N. H. Soc. Glasg. i. pp. 62 & 63.

On a *Terebella* from Mozambique, cf. Bianconi, Mem. Ac. Bologn. ix. p. 214.

Sabellaria annulata. On its habits and abundance in the Bay of Luce, cf. J. Grieve & D. Robertson, P. N. H. Soc. Glasg. i. pp. 30 & 31.

Serpula plicaria, *glomerata*, *annulata*, *pellucida*, *intorta*, *cristata*, *sulcata*, *costalis*, *dentifera*, *sipho*, *arenaria*, and *Vermilia eruca*, Lamk., are referred by L. Vaillant to the *Mollusca*. N. Arch. Mus. vii. pp. 188-198.

New species:—

Harmothoe marphysæ, M'Intosh, P. R. Soc. Edinb. vii. p. 440, Channel Islands. Accompanies *Marphysa sanguinea* in its tube. [No description.]

Gastrolepidia clavigera, Schmarda, l. c. p. 370, fig. 268, Spitzbergen.

Palæonotus chrysolepis, id. l. c. p. 351, fig. 250, hab. —?

Chloëia viridis, id. l. c. p. 370, fig. 267, Sea of Antilles.

Amphinome umbo, Grube, JB. schles. Ges. xlvii. p. 54, hab. —?

Eunice cirribranchis, *tristriata*, *leptocirrus*, *fimbriata*, *parvibranchis*, p. 55, *E. bitorquata*, p. 56, id. l. c., Fiji.

Nereis vitiensis, id. l. c. p. 54, Viti.

Nephthys macandrewi, Corunna, *impressa*, Patagonia, p. 94; *lutrea*, p. 95, Patagonia: Baird, P. L. S. xi.

Glycera ovigera, Schmarda, l. c. p. 369, fig. 266, New Zealand; *G. tes-*

selata, pp. 57 & 65, Quarnero, *martensi*, pp. 60 & 65, Laventuka, *rusa*, pp. 61 & 65, Ovalau, *mauritiana*, pp. 61 & 65, Mauritius, *brevicirris*, pp. 61 & 64, Indian Ocean?, *cirrata*, p. 63, Brazil, *nicobarica*, p. 63, Nicobar, *papillosa*, p. 64, Valparaiso: Grube, l. c.

Goniada echinulata, Grube, l. c. p. 67, Desterro, Brazil.

Melinna palmata, id. l. c. p. 68, St. Malo.

Notophyllum myriaphyllum, Schmarda, l. c. p. 368, fig. 265, Antilles.

Hesione proctochona, id. l. c. p. 367, fig. 264, Jamaica.

Anthostoma ramosum, id. l. c. p. 366, fig. 262, Jamaica.

Colobranchus tetraceus, id. l. c. p. 366, fig. 263, Atlantic.

Chaetopterus macropus, id. l. c. p. 362, fig. 259, New S. Wales.

Siphonostoma antarcticum, Baird, l. c. p. 95, New Zealand.

Clymene grossa, Straits of Magellan, *insignis*, hab. —? : id. l. c. p. 95.

Terebella macrobrachia, Schmarda, l. c. p. 355, fig. 255, hab. —?

Sabellaria bella, Desterro, Brazil, *fissidens*, Chili, *castelnaui*, New Zealand, *laevispinis*, Upolu: Grube, l. c. pp. 69 & 70.

Ereutho serrisetis, Grube, l. c. p. 69, St. Malo.

Euchone rubella, Ehlers, SB. Soc. Erlang. 1871, p. 82, Spitsbergen.

ONYCHOPHORA.

Peripatus quitensis, sp. n., Schmarda, l. c. p. 371, fig. 269, Quito.

OLIGOCHÆTA.

E. RAY LANKESTER ("Outlines of some Observations on the Organization of Oligochaetous Annelids," Ann. N. H. (4) vii. pp. 90-101, 173 & 174) divides the *Oligochaeta* into *Lumbricidae* (= *Terricolæ*) and *Limicolæ*. The latter includes the *Sæmuridae* (with the *Enchytraeidae* as a subgroup) and the *Naididae* (divisible into *Naidinae* and *Chaetogastrinae*). Specimens are easily mounted and preserved by means of glycerine jelly. *Tubifex rivulorum*, D'Udekem, *T. umbellifer*, Kessler, and *Limnodrilus udekemianus*, Claparède (the last two new to Britain), are common in the Thames mud. The more interesting parts of their structure and anatomy are noticed, and the setæ of *Tubifex* figured. There is a rudimentary web to the dorsal setæ of the first ten fasciculate segments, and traces even as far as the fifteenth. This character is most obvious in young specimens, and is unique among the *Oligochaeta*. It is probably due to retention of formerly well-developed ancestral characters. Both sexes coexist in *Tubifex*; but one sex usually predominates over the other, and some specimens are ♀ in the essential and ♂ in the accessory organs of generation. After a certain period of activity, the special organs of both sexes are absorbed in the perivisceral fluid; and it is probably an early stage of this process, during which large masses of ova are detached, which Ratzel has mistaken for dimorphism of the ovaries. The organ called by Claparède a seminal vesicle is probably a gland secre-

ting a cement which aids in forming the spermatophores, which bodies are identical with Claparède's various species of *Pachydermum*. The spermatie pouches and vasa deferentia of the *Chatopoda* are analogous to segmental organs.

Lumbricus. G. Eisen ("Bidrag till Skandnaviens Oligochætfauna, 1. Terri-colæ," Öfvy. Vet. Ak. 1870, pp. 953-971, pls. 11-17) describes and figures with details the following Swedish species:—*L. terrestris*, L.; *L. purpureus*, Eis.; *L. rubellus* and *puter*, Hffmr.; *L. fetidus*, Sav., with varr. *cyaneus*, *cur-neus*, Hffmr., *olivaceus* (= *anatomicus*, Hffmr.), and *pellucidus*, Eis.; *L. riparius*, Hffmr., with varr. *rufescens* and *pallescens*, Eis.; and *L. tetrahedrus*, Sav., with varr. *luteus* and *obscurus*, Eis. A table of the species is prefixed to the paper.

Lumbricus, sp. ? "Note on the Earth-worm" (habits &c.), cf. R. T. Knight, P. Ess. Inst. vi. p. 120.

Perichæta. The structure of a species from Calcutta is fully described by E. Perrier, C. R. lxxiii. pp. 277-280; translated Ann. N. H. (4) viii. pp. 207-210.

P. diffringens, Baird. The habits and internal anatomy are noticed. The species is closely related to those previously known, and has been introduced into England and France with *Orchidaceæ*. L. Vaillant, C. R. lxxiii. pp. 385-387.

Tubifex. Two species are recorded by W. C. McIntosh as common in Scotland, *T. rivulorum* in rivers, and another species (not named) in lakes. Their anatomy is very fully described and figured. They are infested with many parasites (*Opalina*, *Nematoda*, &c.), some of which are also figured. Tr. R. Soc. Edinb. xxvi. pp. 253-267, pls. 9 & 10.

Tubifex rivulorum and *T. umbellifer*. On the structure and origin of the spermatophores or "sperm-ropes," cf. E. Ray Lankester, Q. J. Micr. Sci. xi. pp. 180-187, pl. 10 (Zool. Rec. vii. p. 478).

Enchytræus. This genus extends to Cochin China. E. Perrier, C. R. lxxiii. p. 1176.

Eudrilus, g. n., Perrier, l. c. p. 1175. Intermediate between the *Lumbricidæ* and *Perichætæ*; ♂ genital openings situated on the ventral side of the second segment behind the ring, as in *Perichætæ*; bristles arranged in 4 regular rows, 2 and 2 together, but 3 or 4 perfectly developed bristles often grouped together. Type *E. decipiens*, sp. n., *id.* l. c. p. 1176, found in a case of plants from the Antilles.

Chirodrillus, g. n., Verrill, Am. J. Sc. (3) ii. p. 450. Allied to *Senuris*, but with 6 fascicles of setæ upon each segment, 2 ventral, 2 lateral, and 2 subdorsal; setæ in the ventral and lateral fascicles 4 to 9, simple, acute, and slender; those of the dorsal fascicles stouter and less recurved, 3 to 6 in each fascicle. Intestine wide, somewhat moniliform. Anus large, terminal. Types *C. larviformis* and *abyssorum*, spp. nn., *id.* l. c., Lake Superior.

New species:—

Lumbricus juliformis, hab. — ?, *gouldingi*, St. Vincent, W. Indies, p. 96, *rubrofasciatus*, St. Helena, p. 97, Baird, P. L. S. xi.; *L. lacustris*, Verrill, l. c. p. 449, Lake Superior.

Megascolex (Perichæta) antarctica, New Zealand, *sanctæhelena*, St. Helena, Baird, l. c. p. 96.

Sænuris abyssicola and *limicola*, Verrill, l. c. pp. 449 & 450, Lake Superior.

Tubifex profundicola, id. l. c. p. 451, Lake Superior.

Æolosoma ternarium, Schmarda, l. c. p. 361, fig. 258, Ceylon.

GEPHYREA.

Sipunculus. On structure, cf. J. D. Macdonald, Ann. N. H. (4) viii. pp. 221–223.

Actinotrocha. On the development of a widely distributed Mediterranean species allied to *A. branchiata*, cf. E. Metschnikoff, Z. wiss. Zool. xxi. pp. 244–251, pls. 19 & 20.

Halieryptus spinulosus, Sieb., and *Priapulius caudatus*, Lam. On the early stages of their development, cf. Willemoes-Suhm, *ibid.* pp. 385–387. He figures a portion of the young animal of the last, and an undescribed gland which it possesses in common with *Halieryptus*, pl. 33. fig. 26. Translated Ann. N. H. (4) viii. pp. 143, 144.

Echiurus furcimen, Patagonia, and *Aspidosiphon jukesii*, Lee Sandbanks, spp. nn.: Baird, P. L. S. xi. p. 97.

NEMATOIDEA.

SCHMIDT, A. Ueber den Rüben-Nematoden. Zeitschr. d. Ver. f. Rüben-Industrie im Zollverein, 1871.

Not seen by the Recorder.

Echinoderes and *Desmoscolex*. An abstract of Greef's paper (cf. Zool. Rec. vi. pp. 633, 636) is given in SB. Ver. Rheinl. pp. 8–10.

Oxyuris diisingi and *O. blattæorientalis*, Hammerschmidt. Their habits, structure, and anatomy are fully detailed by O. Butschli, Z. wiss. Zool. xxi. pp. 252–293, pls. 21, 22. They infest the large intestines; and the eggs pass from the body and become developed in the dung. The second species is much rarer, and apparently the older form; and the first is probably a later and better adapted modification, which will supplant the other in time.

O. spinicauda and *brevicaudata*, Duj. Early development described and figured by Willemoes-Suhm, Z. wiss. Zool. xxi. pp. 186–190, pl. 12. figs. 1–10. The embryo of the former develops with equal rapidity in either fresh or salt water.

Ascaris lumbricoides, L. Anatomy described by B. T. Lowne, M. Micr. J. v. pp. 55–64, 87 & 88, pls. 75 & 76. The Nematoids are strictly intermediate between the *Echinodermata* and *Annelida*. In the *Echinodermata* and in *Ascaris* there is a ganglionic ring giving off nerve-cords in a similar manner. The earthworm has a single ventral nerve-cord connected with a ganglionic ring. A step brings us to a single ventral nerve-cord with ganglionic enlargements; and the transition is easy to the whole series of *Homogangliata*. The water-vascular system of the Nematoids with its vesicles resembles that of the *Echinodermata*; the pharynx, pharyngeal teeth, and segmented integument are annelidan; and the nervous system is more like that of an earthworm.

Dracunculus. On a supposed case of Guinea-worm in a patient from S. Carolina, cf. S. W. Mitchell, Pr. Ac. Philad. 1870 (Biol. & Min. Dept.), p. 11.

Ichthyonema globiceps, Rud. Structure fully described and figured by Willemoes-Suhm (Z. wiss. Zool. xxi. pp. 190-200, pl. 13), who considers it to be most nearly related to *Mermis*.

Spiroptera obtusa, Rud., infests mice, rats, &c. Its larva lives in the fat surrounding the digestive tube of the larva of *Tenebrio molitor*. Its anatomy, development, &c. are fully described and figured by P. Marchi, Mem. Acc. Tor. (5) xxv. pp. 1-30, pls. 1 & 2.

Trichina spiralis. Statistical tables of its occurrence in Germany, Denmark, and Sweden from 1864 to 1868. It may have been introduced into Europe either by the agency of an infected person from abroad, by rats, or by the importation of Chinese pigs. All pork should be microscopically examined; and no diseased meat, whether trichinized or not, should be allowed to be used for food. Where trichinosis exists, it is advisable to extirpate the rats in the district. Gerlach, JB. Ges. Hannov. 18 & 19, pp. 17-24.

Nine cases of trichinosis, from 1858 to 1868, are recorded by L. Landois, MT. Vorpomm. i. pp. 56-62, in this district.

Trichinae also occur in the muscular parts of certain insects. Du Plessis, Bull. Soc. Vaud. x. p. 734.

Stephanurus dentatus, Diesing, = *Sclerostoma pingucicola*, Verrill, called "The kidney-worm" in America, occurs in cysts throughout the internal organs and fatty parts of the pig generally, but is most abundant in the fat about the kidneys. W. B. Fletcher, Am. J. Sc. (3) i. pp. 435-437; copied, M. Micr. J. vi. pp. 103 & 104. It is also found in Australia: cf. Morris & Cobbold, M. Micr. J. vi. pp. 243-248.

Aulastoma lacustre and *Gordius lucustris*: cf. J. Leidy, P. Ac. Philad. 1871, pp. 306 & 307.

Polygordius. On a new species from the Crimea, and on the development of two young larvæ observed at Villafranca, cf. E. Metschnikoff, Bull. Pétersb. xv. pp. 503-505.

Hedruris armata, sp. n., E. Perrier, C. R. lxxii. pp. 337-339; N. Arch. Mus. vii. pp. 1-64, pls. 2. Adheres to the mucous membrane at the back of the mouth of *Emys picta*. The anatomy is very fully described, and compared with that of the other species of the genus, and previous observations noticed. All the species of *Hedruris* probably live in pairs. *

Cucullanus dumerili, sp. n., id. Ann. Sc. Nat. (5) xv. (no. 11), pp. 8; N. Arch. Mus. vii. p. 30. In the intestines of *Emys picta*. He fully describes the buccal valves and the muscles which move them, and controverts the opinion of Schnarda that the action of the different parts of the mouth is purely passive. The valves are connected rather with the tegumentary than with the digestive system, and may therefore be regarded as distantly analogous to the lips of *Filaria* and *Hedruris*.

ACANTHOCEPHALA.

Echinorhynchus gigas. Schneider's account of its development (cf. Zool. Rec. vii. pp. 475, 479) is translated, Ann. N. H. (4) vii. pp. 441-443, from SB. oberhess. Ges. (March, 1871)

CESTOIDEA.

The true position of the *Cestoda* and *Echinorhynchi* is between the *Protozoa* and *Coelenterata*; and their resemblance to the *Vermes* and true *Articulata* is merely superficial. Giebel, Z. ges. Naturw. (2) iv. p. 384.

Tetrarhynchus corollatus. A supposed larval form found in the tubules of the liver of *Pagurus bernhardus* described by A. Sanders, M. Micr. J. iii. pp. 72-74, pl. 40.

Bothriocephalus latus. On its mode of development, with notes on the structure and extreme tenacity of life in both parasite and larva, cf. J. Knoch, J. de l'Anat. vii. pp. 1-10. The results obtained correspond with those already recorded by him [cf. Zool. Rec. vii. p. 480].

Tenia echinococcus. The thoracic cavity of a specimen of *Macropus major*, which died in the zoological garden at Cologne, contained a large number of *Echinococci*, which, when administered to dogs, developed into this species. From the wide distribution and isolation of the species, the parasite appears to be a very ancient form of *Tenia*. H. A. Pagenstecher, Verh. Ver. Heidelb. v. pp. 181-186; cf. Ann. N. II. (4) viii. p. 295. [Might not the kangaroo have become infected in Europe?]

Tenia mediocanellata. Portions figured, with remarks, by J. Leidy, P. Ac. Philad. 1871, pp. 53-55. The liver of a young giraffe which lately died in the zoological garden at Hamburg contained numerous *Cysticerci*, identified by K. Möbius with the scolex of this species. Zool. Gart. xii. pp. 168-170.

Tenia inflata, Rud. Egg, cf. Willemoes-Suhm, Z. wiss. Zool. xxi. p. 181, note, pl. 11. fig. 3.

Tenia cæmurus or *Cænurus cerebialis*: cf. Term. Közl. 1869, pp. 80 & 81.

Trilocularia, g. n., P. Olsson, Act. Lund. 1869 (no. 7), p. 5. "Cestoideum bothris 4, sessilibus, inermibus, singula bothria loculis ternis in triangulum dispositis." Type *T. gracilis*, sp. n., *id. l. c.* (cf. description of *Philobothrium acanthiævulgaris*, sp. n., Act. Lund. iii. p. 42, Entozoa, t. 2. figs. 26 & 27). In stomach and intestines of *Acanthia vulgaris*, Varberg and Bahus, near Grafvarne.

Microbothrium, g. n., *id. l. c.* p. 3. "Corpus planum, postice bothrio minimo longitudinali lanceolato, inermi. Crura intestini ramos extrorsum emittentia." Type *M. apiculatum*, sp. n., *id. l. c.* p. 4, fig. 13, on back of *Acanthia vulgaris*, Skagerack; also *M.* (?) *fragile*, sp. n., *id. ibid.*, on back of *Raia batis*.

Stenotenia, g. n., Gervais, C. R. lxxi. pp. 780 & 781. Intermediate between the *Tenias* and *Ligulæ*; body long, slender, without articulations; a cephalic swelling with four suckers, but no circle of hooks. Type *S. delphini*, *id. ibid.*, sp. n., infests the dolphin, Cape Finisterre.

Plagiotenia, g. n. (not characterized), W. Peters, P. Z. S. 1871, pp. 146 & 147. Type *Tenia gigantea*, Peters, from African rhinoceros (apparently = *T. magna*, Murie, from the Indian rhinoceros). The description of *T. gigantea* is quoted, and the head and first segments figured.

Dibothrium cordiceps, sp. n., J. Leidy, P. Ac. Phil. 1871, p. 306, infests *Salmo fontinalis*, Upper Yellowstone River.

TREMATOIDEA.

Polystoma integerrimum. Willemoes-Suhm describes the eggs and young larvæ of this common parasite in the bladder of *Rana temporaria*. He thinks the young larvæ enter the frog directly, without passing through any other animal. Nachr. Ges. Götting. 1870, pp. 181-185.

Distoma hepaticum apparently commences its existence as *Cercaria cystophora*, Wagener, parasitic on *Planorbis marginata*, according to Willemoes-Suhm, Z. wiss. Zool. xxi. pp. 175-179. He also describes and figures the anatomy and eggs of *D. megastoma*, Rud., parasitic on rays and sharks in the Mediterranean, and notices *D. sinuatum*, *fasciatum*, *capitellatum*, and *fili-forme*, Rud., figuring the eggs of the first two (l. c. pp. 179-182, pl. 11. figs. 4-7).

Distoma ocreatum, Rud. On a free-living, sexless, larval form found in the Baltic and Sound, and supposed to belong to this species, cf. Willemoes-Suhm, Z. wiss. Zool. xxi. pp. 382 & 383; translated Ann. N. II. (4) viii. pp. 142 & 143.

Amphistoma conicum and *Distoma hepaticum*. From observations on these species, L. Stieda (Arch. Anat. Phys. 1871, pp. 31-40, fig.) confirms those of Blumberg. The chief difference between the *Trematoda* and *Bothriocephali* lies in the position of the vagina. In the former it opens on the back, and self-fertilization is impossible; while in the *Bothriocephali* it opens near the penis, and self-fertilization is both possible and necessary.

Amphistoma conicum. C. Blumberg (Ueber den Bau des *Amphistoma conicum*. Dorpat: 1871, 4to, pp. 60, plate) gives a full account of its anatomy, preceded by remarks on his mode of examination and preparation of the specimens, and a short bibliography. It infests the paunch of ruminants, and is found in clusters in oxen, chiefly near the point where the paunch adjoins the bonnet. It adheres so strongly to the mucous membrane between the long lancet-shaped projections of the paunch as to require considerable force to dislodge it, when it leaves behind a small rounded elevation, undoubtedly caused by its sucking. The so-called "Laurer's canal" forms the indication of a vagina. There is no internal connexion between the ♂ and ♀ organs of the *Trematoda*, as was formerly supposed; and the union of two individuals always takes place.

For an analysis of Blumberg's work, cf. Z. ges. Naturw. (2) iv. pp. 496-499.

Leucochloridium paradoxum: cf. M. Schultze, SB. Ver. Rheinl. xxviii. p. 129.

Polycotyle, g. n., Willemoes-Suhm, Z. wiss. Zool. xxi. p. 183. "Corporis pars anterior attenuata, incisura a parte postica secreta. Os sine acetabulis. Plectana uncinulis carentia, numerosa in lamella asymmetrica corporis partem posteriorem longitudinaliter ornante. Ova subrotunda." Type *P. ornata*, sp. n., id. l. c. pl. 11. fig. 1, in stomach of *Alligator lucius*, from Charleston.

Macraspis [preoccupied in *Coleoptera*], g. n., P. Olsson, Act. Lund. 1869 (no. 7), p. 2. Allied to *Aspidogaster*. "Corpus elongatum; scutum ventrale longissimum, septis transversis plurimis et una serie loculorum interme-

diorum insigne. Os in apice." Type *M. elegans*, sp. n., *id. l. c.* figs. 7-12, in gall-bladder of *Chimæra monstrosa*, Skagerack.

Distoma pseudostoma, sp. n., Willemoes-Suhm, *l. c.* p. 185, pl. 11. fig. 2, in small intestines of *Alligator lucius*, Charleston.

DISCOPHORA.

E. GRUBE ("Beschreibungen einiger Egel-Arten," Arch. f. Nat. xxxvii. pp. 87-121, pls. 3 & 4) describes the following known as well as many new spp.: — *Hirudo elegans*, *novemstriata*, *brevis*, Grube, pp. 91-93, pl. 3. figs. 2-4; *H. (Oryptychus) striatus*, Grube, p. 95, pl. 3. fig. 5; *Aulacostomum gulo*, Brahm, p. 97, pl. 3. fig. 7; *Nephelis quadristriata*, Grube, p. 104; *Clepsine octostriata*, Grube, p. 109, pl. 4. fig. 4; *C. carinata*, Dies., p. 110; *C. maculosa*, Rathke, p. 114, pl. 4. fig. 1.

Clepsine bioculata. Development described by E. Metschnikoff, Bull. Pétersb. xv. pp. 505 & 506.

Cylicobdella, g. n., Grube, *l. c.* p. 101. "Subterranea; corpus rotundato-depressum elongatum, angustum, antrorsum valde attenuatum, annulis perfectis ad 100; discus anterior haud dilatatus, posterior acetabuliformis; anus rima transversa, satis magna, supra basin ejus sita. Plicæ maxillares crassiores nullæ, pro iis plures tenuiores, circulum componentes. Oculi haud distinguendi. Aperturæ genitales inter 27mum et 28mum et inter 29mum et 30mum sitæ." Type *C. lumbricoides*, sp. n., *id. l. c.* p. 101, pl. 3. fig. 6, Desterro, Brazil.

New species:—

Hirudo quinquelineata, *id. l. c.* p. 88, pl. 3. fig. 1, Błagoweschtschensk.

Aulacostomum kraussi, Port Natal, *umbrinum*, Massachusetts, *ænops*, Mississippi: *id. l. c.* pp. 98-100.

Nephelis fervida, Verrill, Am. J. Sc. (3) ii. p. 451, Lake Superior.

Piscicola conspersa, Angara, *torquata* and *multistriata*, Baikal: Grube, *l. c.* pp. 115, 117, 119, pl. 4. figs. 5, 7, 6.

Ichthyobdella punctata, Verrill, *l. c.* p. 451, Lake Superior.

Clepsine budgii, *lineolata*, Desterro, Brazil, *tuberculifera*, Surinam, pp. 105-107; *echinulata*, *mollissima*, pp. 110, 112, pl. 4. figs. 2 & 3, Baikal: Grube, *l. c.*

TURBELLARIA.

New species:—

Borlasia incompta, Ehlers, SB. Soc. Erlang. 1871, p. 86, Spitsbergen; *B. elizabethæ*, McIntosh, P. R. Soc. Edinb. vii. p. 439, Herm.

Ommatoplea ophiocephala, Schmarda, Zoologie, i. p. 271, fig. 189, hab. — ?

Nemertes maculosa and *teres*, Ehlers, *l. c.* pp. 85 & 86, Spitsbergen.

Catenula quaterna, Schmarda, *l. c.* p. 270, fig. 188, Cape of Good Hope.

Thysanozoum cruciatum, *id. l. c.* p. 268, fig. 186, hab. — ?

Stylochus oligoglena, *id. l. c.* p. 265, fig. 183, Indian Ocean.

Balanoglossus kuppferi, Willemoes-Suhm, Nachr. Ges. Götting. 1870, pp. 478-480; Z. wiss. Zool. xxi. pp. 383-385, pl. 33. figs. 31 & 32: Oresund, near Hellebaek, Seeland.

Sphyrocephalus dendrophalus, Schmarda, *l. c.* p. 269, fig. 187, Ceylon.

ROTIFERA.

BARTSCH (*l. c.*) classifies the *Rotatoria* as follows :—

Order I. ENTERODELA.

With a stomach, intestine, and anus.

Fam. 1. FLOSCULARINÆ, Bartsch (= *Tubicolarina*, Carus, = *Monotrocha* and *Schizotrocha*, Ehrenb.). Form clavate; foot long, annulated; ciliary organ like the corolla of a flower; usually sedentary animals, placed in a sheath. (*Floscularia* and *Melicerta*.)

Fam. 2. HYDATINÆ, Ehr. (s. str.). Body-envelope saccular, soft, varying in form from cylindrical to conical; foot and its terminal styles short, in part not retractile. (*Hydatina*, *Pleurotrocha*, *Synchaeta*, *Notommata* (incl. *Eosphora*, Ehr.), and *Diglena*.)

Fam. 3. LONGISETÆ, Bartsch. Skin soft or firm; body varying in form from cylindrical to oval; foot very much reduced; terminal styles one or two, long, setiform. (*Distemma*, *Rattulus*, *Furcularia*, and *Monocerca*.)

Fam. 4. SCARIDINA, Carus. Foot long-jointed, frequently with long spines and points, not retractile; skin soft or hardened. (*Scaridium* and *Dinocharis*.)

Fam. 5. PHILODINÆ, Ehr. Body fusiform; foot retractile, like a telescope, forked at the end; one cervical movable palpus. (*Callidina*, *Philodina*, *Rotifer*, and *Actinurus*.)

Fam. 6. LORICATA, Bartsch (= *Brachionea*, Carus, = *Euchlanidota* and *Brachionea*, Ehr., = *Dinocharis*). With a hard carapace sharply separated from the head and foot; soft parts retractile. (*Euchlanis*, *Lepadella*, *Metopidia*, *Brachionus*, *Monostyla*, *Pterodina*, *Anurea*, *Salpina*, and *Colurus*.)

Order II. GASTERODELA.

Fam. 7. ASCOMORPHA, Perty. Body short, cylindrical, truncated in front, rounded off behind; no intestine or anus; one cervical eye. (*Ascomorpha*.)

C. CUBITT (*M. Micr. J.* vi. pp. 165-169) objects to the usual terminology employed in describing the structure of the *Rotifera*. He proposes to substitute the term *vagina* for *lorica*, *corona* for *disk*; to employ *neural* for the ganglion side, and *hæmal* for the opposite; and to call the active vibratile appendages of the corona *cilia*, in contradistinction to the setæ, which perform an intermittent action when investing the corona. For want of a more appropriate term, we must also call the delicate hairs which furnish the pistons of the antennæ *cilia*.

The same author ("On the winter Habits of the *Rotatoria*," *l. c.* v. pp. 168-172, pl. 81) provisionally divides the members of the loricated families of sect. 1 into the solitary fixed and the clustered free, and those of sect. 2 into

the temporarily fixed and the absolutely free. *Cephalosiphon limnias*, Ehr., is truly a *Philodina*. During the winter, *Philodina*, *Floscularia*, *Stephanoceros*, *Melicerta*, and *Limnias* build up a floccose covering around them to a greater or less extent. Some of these forms are figured, encased and expanded. Chantrell and Davis (*l. c.* v. p. 336, vi. pp. 48 & 49) reply to some of his observations; and the latter states that *Cephalosiphon* is not a *Philodina*.

Floscularia. The rotary organ is always 5-lobed; and the cilia move during the unfolding of the lobes, or when approached by a living organism. Bartsch, *l. c.*

Melicerta. Cubitt points out its essential characters, and refers to it the genera *Limnias*, *Æcistes*, and *Tubicolaria*: *l. c.* vi. pp. 165-169.

Melicerta ringens. Habits described by Bartsch, *l. c.* On the formation of its tube, *cf.* H. Cubitt, *l. c.* pp. 208 & 209, pls. 83 & 84.

Æcistes crystallinus. This and other Rotifers in a warm-water pond at Windsor are mostly destitute of tubes. The mode of action of the cilia is still doubtful, some observers thinking that only the second row act in carrying the food to the mouth. Davis & Chantrell, *M. Micr. J.* v. pp. 41 & 42.

Æcistes intermedius, Davis, figured by H. Cubitt, *l. c.* pl. 82 (lower fig.).

Hydatina senta possesses, attached to the brain, at the points where the nerves running to the two cervical palpi are given off, two pedunculate (auditory?) vesicles, consisting of a very thin envelope, enclosing finely granular contents, in which about half a dozen orange-red globules are suspended. During the movements of the animal these vesicles oscillate to and fro. The cilia on the interior of the rotary organ extend down to the ground. Bartsch, *l. c.*

Philodina aculeata, var. (?) or sp. n. (?): *cf.* J. Barker, *Q. J. Micr. Sci.* xi. p. 210.

Monommata, g. n., Bartsch, *l. c.* Body cylindrical; skin partially hardened; 2 long caudal points, and one cervical eye. *M. (Notommata) tigris* and *longiseta*, Ehr.

Pedalion mira, g. & sp. nn., C. T. Hudson, *M. Micr. J.* vi. pp. 121-124, 215, pl. 94. A transitional form, showing some affinities to the *Crustacea*.

New species :—

Floscularia cyclops, Cubitt, *l. c.* vi. p. 83, pl. 93. Occurs associated with *F. coronetta*: *F. ornata* is figured for comparison.

Melicerta annulata, *id.* *l. c.* vi. p. 167, pl. 98.

Stephanoceros horatii, *id.* *l. c.* vi. p. 166.

Eosphora caribæa, Schmarda, *Zoologie*, i. p. 341, fig. 241.

Hexarthra polyptera, *id.* *l. c.* p. 342, fig. 242, El Kab.

Rotifer megaceros, *id.* *l. c.* p. 345, fig. 244, Alexandria.

Pterodina valvata, C. T. Hudson, *M. Micr. J.* v. pp. 25-29, pl. 72, Bristol, ponds.

Arthracanthus quadricornis, Schmarda, *l. c.* p. 345, fig. 246, Egypt.

Ascomorpha saltans, Bartsch, *l. c.*, Tübingen.

ECHINODERMATA

BY

W. F. KIRBY, M.E.S. &c.

SCHMARDA (Zoologie, i. pp. 234-262) arranges the ECHINODERMATA as follows :—

ASTEROIDEA.

BLASTOIDEA, CYSTIDEA, CRINOIDEA, *Encrinida*, *Actinocrinida*, *Apiocrinida*, *Pentacrinida*, *Cyathocrinida*, *Anthocrinida*, &c. (mostly fossil), *Comatulida*, *Stellarida*, *Euryalida*, *Ophiurida*, *Brisingida*, *Asterida*.

ECHINOIDEA.

TESSELLATA, EUECHINOIDEA, *Cidarida*, *Echinina*, *Diadematina*, *Echinometrina*, *Salenida*, *Galeritida*, *Galeritina*, *Echinoneina*, *Dysastrida*, *Clypeastrida*, *Clypeastrina*, *Laganina*, *Mollitina*, *Cassidulida*, *Spatangida*, *Ananchitina*, *Spatangina*.

HOLOTHURIOIDEA.

APNEUMONA, *Synaptida*, *Oncinolabida*, TETRAPNEUMONA, DIPNEUMONA, *Molpadida*, *Dendrochirota*, *Aspidochirota*.

VERRILL (Tr. Conn. Ac. i. pp. 568-593) remarks on the following species, most of which he redescribes :—

Plataster danæ, Verr., pl. 9. figs. 10 & 10a, E. Patagonia?; *Plagionotus pectoralis*, Lamk., W. Indies and (var.) Florida; *Gymnasteria spinosa*, Gray; *Mithrodia bradleyi*, Verr.; *Acanthaster ellisi*, Verr.; *Heliaster kubiniji*, Xant.; *Astropyga depressa*, Gray (= *A. venusta*, Verr.); *Echinodiadema coronatum*, Verr., is not the young of *Diadema mexicanum* as supposed by A. Agassiz; *Boletia pictus*, Verr.; *B. rosea*, Ag., is a true *Boletia* and not a *Lytochinus*, as formerly supposed by Verrill; *Toxocidaris mexicana*, Ag., is distinct from *Heliocidaris mexicana*, Ag., which = *Echinometra michelini*, var.; but *Echinometra michelini*, Verr., = *Toxocidaris crassispina*, Ag.; *Echinus homolostoma* and *erythrogramma*, Verr., also belong to *Toxocidaris*, but *Tox. franciscana*, Ag., from California, may be a *Loxechinus*, if this genus is truly distinct from *Toxocidaris*; *Echinometra vanbrunti* and *rupicola* are probably distinct; *Encope grandis*, Ag.; *E. californica*, Verr., pl. 10. figs. 5 & 6; *Melita longifissa*,

Mich.; *Clypeaster testudinarius*, Gray, *nec* Mart. (= *C. speciosus*, Verr.), pl. 10. figs. 7 and 7a, La Paz, *nec* Borneo; *Mona grandis*, Gray (= *M. magna*, Verr.), La Paz, not Australia; *Agassizia subrotunda*, Gray, and *A. ovulum*, Lütken (young), = *A. scrobiculata*, Val.

VERRILL also (l. c. pp. 592 & 593) points out the distinctive characters of *Melalia* and *Plagionotus*, and protests against the reading of papers being considered equivalent to publication.

For notes on recent and fossil *Echinodermata*, cf. W. Swanston, Rep. Belf. Club, viii. pp. 40-42.

Forty-three species of *Echinodermata* are enumerated by G. Hodge (Tr. North. Durh. iv. pt. 1. pp. 120-150, pls. 1-3, 5) as occurring off the coasts of Northumberland and Durham. Very full localities are given. The pedicellariæ are perhaps modified tentacles. *Ophiura normani*, Hodge, = *affinis*, Lütken. A specimen of *Astropecten irregularis*, with bifurcated rays and abnormal patellæ, is noticed. *Asterias rubens*, varr. *hispida*, *attenuata*, and *gigantea* are characterized. The plates mostly represent spicules &c.

On *Echinodermata* in Firth of Clyde, cf. J. Grieve, P. N. H. Soc. Glasg. i. pp. 61, 63-66.

On the embryology of Echinoderms, cf. A. Agassiz, Mem. Am. Ac. ix. pp. 1-30, 4 plates. The principal species noticed and figured in various stages are *Toxopneustes dробachiensis*, Ag., *Ophiophilus bellis*, Lym., *Cuvieria fabricii*, Düb. & Kor., *Amphiura squamata*, Sars, and *Asteracanthion flaccida*, Ag. The technical part is too elaborate to admit of any abstract. The pedicellariæ in sea-urchins fulfil the office of scavengers. The early stages of all Echinoids recall the first which appeared in geological ages. By this standard the true *Echini* are the lowest, next the Clypeastroids, then the Echinolamps, and finally the Spatangoids. The lowest of the *Echini* are the *Cidaridæ*, followed by the *Diadematidæ*, *Echinometradæ*, *Echinocidaridæ*, and *Helicoidaridæ*. The succession of the groups in time is also noticed. Leuckart's division of the Radiata into two great groups, *Echinodermata* and *Cœlenterata*, cannot be maintained. The *Ctenophora* form the connecting link between them.

During a trawling-expedition in the summer of 1870, 14 species of *Echinodermata* were obtained in shallow water on the fishing banks off the east and west coasts of Jutland (C. A. Bergh, Act. Lund. 1870, ii. no. 6. pp. 56, pls. 2). East coast: *E. miliaris*, *T. dræbachiensis*, *E. pusillus*, *E. cordatum*, *B. lyrifera*, *A. rubens* and *muelleri*; *A. muelleri*; *O. squamosa*, *A. filiformis*, and *A. elegans*. West coast: *O. texturata* and *albida*, *E. esculentus*, *E. pusillus*, *E. cordatum*, and *B. lyrifera*. Very full tables of their geographical distribution are given. *T. dræbachiensis*, *A. rubens*, and *O. squamosa* are Arctic species, *E. pusillus* and *A. filiformis* Mediterranean, and the others boreal.

LÜTKEN has given a revised list of the *Echinodermata* occurring on the coast of Denmark, with a very full analysis of their distribution (Vid. Medd. 1871, pp. 135-143). His former list, published in 1856, included 23 species; but he now enumerates 30 (exclusive of *Thyonidium commune*, Forbes, and *Astropecten squamatus*, doubtful spp.), viz. *Holothuridæ* 4, *Echinidæ* 8, *Asteriidæ* 9, *Ophiuridæ* 9. (a) 3 spp. occur in the German Ocean and Skagerrack, not yet recorded from the Danish part of the Kattegat; (b) 4 spp. occur in the Kattegat, but not yet known to occur in the Øresund or generally in

the sounds and fiords; (c) 12 spp. occur both in the Kattegat and in the Æresund, but, except perhaps *Echinocardium cordatum*, are not found in the other sounds and fiords; (d) 7 spp. extend rather further, but are all wanting in Svendborg Sound and Kiel Bay; (e) 4 spp. occur in Svendborg Sound, of which *Echinocyamus pusillus* only is found in Kiel Bay.

LÜTKEN, l. c. pp. 305-308, enumerates 23 *Echinodermata* as obtained in Spitsbergen by Heuglin's expedition. The brief notice in Z. ges. Naturw. (n. s.) iv. p. 283, does not mention if any are new.

VERRILL gives a list of 50 species of *Ophiuroidea*, *Asteroidea*, and *Echinoidea* occurring in the Gulf of California and off Cape St. Lucas, and remarks on their geographical distribution. The *Holothurioidea* are as yet unknown. Tr. Conn. Ac. i. pp. 593-596.

VERRILL, Am. J. Sc. (3) ii. pp. 357-362, notices many Echinoderms, Zoophytes, Annelida, &c. observed during the dredging operations connected with a fishing commission.

On the *Echinodermata* dredged off Cuba and Florida by the U. S. Gulf-Stream Expedition, cf. Pourtales, Bull. Soc. Neuch. viii. pp. 386-389. A list of species is appended [cf. Zool. Rec. vi. p. 639, and Arch. Sci. Nat. xli. pp. 83-90].

On a few *Echinodermata* &c. obtained near Port Macon, N. C., cf. E. Coues, P. Ac. Phil. 1871, p. 148.

CRINOIDEA.

BEYRICH, "Ueber die Basis der *Crinoidea brachiata*" (MB. Ak. Berl. 1871, pp. 33-55), chiefly treats of fossil species.

Antedon and *Pentacrinus*. Structure described and compared with that of the Palæozoic Crinoids. Wyville Thomson, P. R. Soc. Ediub. vii. pp. 415-418.

Comatula mediterranea. On its minute anatomy, cf. C. Grimm, Bull. Pétersb. xvii. pp. 3-9, plate. The interior of the fibrous layer of the nucleus contains a remarkable system of canals, which the author supposes to be connected with respiration. On the great similarity between its larval development and structure and that of the *Bryozoa*, cf. E. Metschnikoff, Bull. Pétersb. xv. pp. 508 & 509; Am. J. Sc. (3) ii. pp. 220 & 221.

Hyponome sarsi, Lovén (cf. Zool. Rec. v. pp. 557, 560). Lovén's paper was republished in Gëfv. Vet. Ak. 1869, pp. 729-731.

Holopus rawsoni, sp. n., Gray, Ann. N. H. (4) viii. pp. 394-396, Barbadoes (5 fathoms).

OPHIUROIDEA.

T. LYMAN (Illustrated Catalogue of the Museum of Comparative Zoology at Harvard College, No. 6. Supplement to *Ophiuridæ* and *Astrophytidæ*. Cambridge, U. S. A.: 1871. pp. 17, pls. 2) describes and figures several new species, with details of others. A list of the principal writings on the subject is prefixed, supplementary to one published in 1865.

The author maintains that all binomial names, whether pre-Linnæan or not, should be retained, and that any author who transfers a species from one genus to another, ought to attach his own name to the alteration instead of that of the original describer[1].

Ophiophragmus wurdemanni, Lyman, noticed by Verrill, Am. J. Sc. (3) ii. p. 133.

Amphipholis, g. n., Ljungman *, Öfv. Vet. Ak. 1866, p. 165. Allied to *Amphiura*. "Discus utrinque squamulis nudis tectus, dorso aut marginato aut immarginato. Scuta radialia distincta aut plane contingentia aut plus minusve cuneolo squamarum sejuncta. Papillæ orales quaternæ vel ternæ in ordine continuo dispositæ. Brachia quinque vel rarissime sex." Type *A. januarii*, sp. n., *id. l. c.*, Rio Janeiro.

Ophiogymna, g. n., *id. l. c.* p. 163. Allied to *Ophiocnemis* and *Ophiothrix*. "Discus, parte minuta nuda in scutis radialibus supra insertionem brachiorum excepta, totus cute molli tectus inermis. Ossicula oralia nuda, papillis oralibus carentia. Papillæ dentales adsunt. Brachia longa. Spinæ brachiales nudæ, scabræ." Type *O. elegans*, sp. n., *id. l. c.*, Singapore, Hong Kong.

Ophiomaza, g. n., Lyman, *l. c.* p. 9. Tooth-papillæ numerous, arranged in a close vertical oval, as in *Ophiothrix*; no mouth-papillæ. Disk below naked, but covered above with large swollen radial shields and plates. Arm-spines stout, nearly smooth, as in *Ophiocoma*. Type *O. cacaotica*, sp. n., *id. l. c.* pl. 1. fig. 15, Zanzibar.

New species :—

Ophiura (vel *Ophioglypha*) *kinbergi*, Ljungman, *l. c.* p. 166, Sydney, New Holland.

Ophioglypha sinensis, Lyman, *l. c.* p. 12, pl. 1. figs. 1 & 2, Hong Kong; *O. lymani*, Ljungman, *l. c.* 1870, p. 472, Altata, Mexico.

Amphipholis addita, Verrill, Am. J. Sc. (3) ii. p. 132, New Haven.

Ophiocnida putnami, Lyman, *l. c.* p. 11, pl. 1. fig. 9, Hong Kong.

Ophiothela tigris, *id. l. c.* p. 10, pl. 1. figs. 10-12, Pacific?

Ophiactis magellanica, Straits of Magellan; *fragilis*, Hawaii: Ljungman *l. c.* 1866, p. 164.

Ophiophragmus loveni, *id. ibid.* p. 165, Rio Janeiro.

Ophiacantha vivipara, *id. l. c.* 1870, p. 471, Altata.

Ophiomastix janualis, Lyman, *l. c.* p. 14, pl. 1. figs. 13 & 14, Mexillones Bolivia.

Ophiothrix clypeata, Ljungman, *l. c.* 1866, p. 163.

ASTEROIDEA.

Asteriidae. Lütken (Vid. Medd. 1871, pp. 227-304, pls. 4 & 5; summary, pp. 19-26) notices many known genera and species as follows:—*Astropecten* is best distinguished from *Archaster* by the want of an anus; the difference in the shape of the ambulacra is less satisfactory. *Astropecten velitaris*, Mart., is really distinct from *A. armatus*. *Ctenodiscus australis*, Lovén, *Archaster tenuispinus*, Düb. & Kor., and *Choriaster granulatus*, Ltk., are redescribed. *Goniaster*, Ag., will include the 3 subgenera *Stellaster* (= *Dorigana*, Gray), *Astrogonium*, and *Goniodiscus*, and the following species, the characters of which are more or less fully pointed out:—*G. equestris*, Retz. (= *S. childreni*, M. & Tr.), *G. incii*, Gray (= *S. gracilis*, Möb.), *G. tuberculosus*, Mart. (probably distinct from *G.*

* I am indebted to Dr. E. P. Wright for calling my attention to this paper of Ljungman's.—W. F. K.

incii); *G. belcheri*, Gray; *G. muelleri*, Gray (= *Dorigona reevesi*, Gr.); *G. duebeni*, Gr.; *Dorigona longimana*, Gr. (*Astrogonium longimanum*, Gr., = *A. souleyeti*, Duj. & Huppé), wrongly considered by Gray as *G. equestris*, var., may be a seventh species of *Goniaster*, but is probably an *Archaster*. *Ophidiaster*, *Linckia*, and *Scyaster* are well-marked subgenera of this group, if not truly distinct, as are also *Liaster*, Pet., and *Mithrodia*, Gray. A synopsis of the known species of *Linckia* is given. The *Echinodermata* known from Nicobar are enumerated:—*Asteridæ* 10, *Ophiuridæ* 10, *Crinoideæ* 1, *Echinidæ* 5—in all 26 species. *Scyaster desjardinsi*, Mich., perhaps = young form of *S. tuberculatus*, M. & Tr. *Echinaster gracilis*: a specimen doubtfully belonging to it described from New Zealand. *Echinaster*: the N.-American species are revised as follows:—*E. brasiliensis*, M. & Tr. (≠ *Othidia multispina*, Gray); *E. scutus*, Say (= *E. spinosus*, M. & Tr.); *E. spinulosus*, Verr.; *E. crassispinus*, Verr. (= *E. spinosus*, Ltk.); *E. serpentarius*, M. & Tr.; *E. tenuispinus*, Verr. *Acanthaster*: *A. ellisi* and *solaris*, Gray, and *A. echinites*, Ell., appear to be good species; but further information on the genus is much required. *Leptasterias* and *Coscinasterias*, Verr., *Stichaster*, M. & Tr., and *Helias*, *Unio*phora, and *Margaraster*, Gray, are rather to be regarded as sections of *Asterias* than as genera; *Pycnopodia*, Stimps., is more distinct. *Asterias stellionurus*, Val., occurs in Spitsbergen, and probably not, as stated, in Iceland. *Asterina chilensis*, Ltk., is distinct from *Asterias calcaratus*, Val. Finally, Lütken gives an index to all the *Asteriidæ* mentioned in his papers in Vid. Medd. 1856-1871, with the following additional synonyms:—*Archaster typicus*, M. & Tr. (*nicobaricus*, Behn); *A. hesperus*, M. & Tr. (*Stellaster sulcatus*, Möb.); *Astropecten muelleri*, M. & Tr. (*echinulatus*, M. & Tr.); *A. aster*, Fil. (*squamatus*, M. & Tr.); *Asterina gibbosa*, Put. (*Asteriscus verruculatus*, M. & Tr.; *ciliatus*, Lor.); *A. stellifera*, Möb. (*brasiliensis*, Ltk.); *Oreaster gigas*, L. (*O. reticulatus*, L., *aculeatus*, Gr., *lapidarius*, Grube, *tuberosus*, Behn); *O. dorsatus*, L. (*clavatus*, M. & Tr.); *O. armatus*, Gr. (*Goniodiscus armatus*, Ltk.; *G. michelini*, Perr.; *conifer*, Möb. &c.); *Goniaster acutus* (*placentiformis*), Heller; *Echinaster gracilis*, M. & Tr. (*rigidus*, Grube ?); *Chataster longipes* (*Asterias canariensis*, D'Orb. ?), *Cribella sanguinolenta*, Müll. (*oculata*, Put., *eschrichti*, &c.); *Asterias rubens*, L. (*violaceus*); *A. tenuispinus*, Lmk. (*atlanticus*, Verr.); *A. problema*, Stp. (*albus*, Stimpson).

Uraster rubens, with a bifurcated restored limb: cf. D. Robertson, P. N. H. Soc. Glasg. i. p. 41.

Cribella rosea. Its rays, like those of *U. glacialis*, have a tendency to break off close to the disk: *id.* l. c. p. 37.

Asteracanthion rubens, *Solaster papposus*, and *Astropecten aurantiacus*. The nerve which runs along the arm leaves the furrow before reaching the extremity, and bifurcates, the lower branch extending to the eye, and the upper one terminating in a long extensile and partly ciliated feeler. The structure of this and the eye, and also that of the nervous, circulatory, and respiratory systems, is described by R. Greef, "Ueber den Bau der Echinodermen," SB. Ges. Marb., Nov. 1871, abstracted Z. ges. Naturw. (2) iv. pp. 499 & 500.

Solaster endeca with only 6 rays: cf. D. Robertson, l. c. p. 37.

Asterias (*Leptasterias*), sp. n., from the coast of Amoorland, described but not named by Lütken, Vid. Medd. 1871, p. 298.

Luidia fragilissima is more brittle in summer than in spring : Robertson, *l. c.* p. 36.

Lepidaster [already employed for a fossil genus of *Asteriidae* by Forbes], g. n., Verrill, Tr. Conn. Ac. i. p. 577. Disk small, rays rounded, elongated; whole surface covered with a thin smooth skin, without granules or spines. Skeleton consists of the rays of several similar dorsal and lateral rows of rather large, more or less rhomboidal, overlapping plates, so articulated with those of the adjacent rows as to leave a regular row of pores between all the rows of plates, except between the ventral and ambulacral rows. On the disk, the plates are pentagonal. The interambulacral plates bear an inner row of small slender spines, several to each plate, bordering the ambulacral groove, and outside, but adjacent to these, a row of much larger oblong spines, not more than one to a plate. Type *L. teres*, sp. n., *id. l. c.*, La Paz.

Labidaster, g. n., Lütken, Vid. Medd. 1871, p. 289. Allied to *Acanthaster*, *Pycnopodia*, and *Pedicellaster*. Arms numerous, 30 or more, slender, acuminate, almost serpentiform, brittle at base, annulated; pedicellariæ very numerous, placed crosswise; madriporiform body single; disk and terminal portion of the arms furnished above with scattered spines and straight pedicellariæ. Ambulacral legs arranged in a double row. Type *L. radiosus*, sp. n., *id. l. c.* p. 293, Patagonia. This species overthrows Perrier's proposal to divide the *Asteriidae* into two main divisions, viz. :—those with crossed pedicellariæ, either alone or accompanied with straight ones, and four rows of ambulacral feet; and those with pincer-like and valvular pedicellariæ, and two rows of ambulacral feet.

Platasterias [preoccupied in *Echin.* by Blainville, 1830], g. n., Gray, P. Z. S. 1871, p. 136. Allied to *Astropecten*, but much flatter, and more like a deeply divided *Palmipes*; no marginal tessera; a single row of marginal spines. Type *P. latiradiatus*, sp. n., *id. l. c.* pl. 9, Mexico (Tehuantepec).

New species :—

Asterias amurensis, Lütken, Vid. Medd. 1871, p. 296, Ochotsk and coast of Amoorland.

Echinaster tenuispinus, Verrill, Tr. Conn. Ac. i. p. 577, La Paz; *E. cribellus*, Lütken, *l. c.* p. 288, Valparaiso (?=*E. serpentarius*).

Linckia nicobarica, Lütken, *l. c.* p. 265, Nicobar (compared with *L. levigata*, L.).

Ophidiaster asperulus, p. 274, pl. 5. fig. 4, Viti, Fiji; *granifer*, p. 276; *cribrarius*, p. 277, Tonga : *id. l. c.*

Scytaster subtilis, *id. l. c.* p. 278, pl. 5. fig. 5, China Sea.

Goniaster americanus, Charleston, S. C., *africanus*, W. Africa : Verrill, Am. J. Sc. (3) ii. pp. 130, 191.

Oreaster australis, New Holland, pp. 252 & 263, *hedemanni*, Billiton, pp. 255 & 263, *westermanni*, Bengal, pp. 257 & 264, *gracilis*, N. Australia, pp. 260 & 264 : Lütken, *l. c.*

Asterina cabalistica, *id. l. c.* p. 242, pl. 4. fig. 1, South Seas.

Astropecten euryacanthus, Nicobar, p. 231, *javanicus*, Java, p. 234 (with notes on its variation) : *id. l. c.*

Luidia brevispina, *id. l. c.* p. 228, Mazatlan.

ECHINOIDEA.

The following (somewhat abridged) systematic arrangement of the regular Sea-urchins is given by Troschel, SB. Ver. Rheinl. xxviii. p. 91 :—

A. Tubercles perforated.

- a. Tubercles smooth (in living forms); ambulacral area without perforated tubercles; interambulacral area with 2 rows of large perforated tubercles; no oral notches..... *Cidaridæ*.
- b. Tubercles crenulated; ambulacral area with perforated tubercles; interambulacral area with several rows of large ones; oral notches distinct *Diadematidæ*.

B. Tubercles not perforated.

- a. Tubercles crenulated *Salmacidæ*.
- b. Tubercles smooth,
 - a. Sutural pores *Mespiliidæ*.
 - β. No sutural pores.
 - * Periproct closed by 4 plates..... *Echinocidaridæ*.
 - ** Many small plates on the periproct.
 - † Body circular or pentagonal.
 - ‡ 3 pairs of pores on each arc.
 - Oral notches shallow, no ocular plate reaching the periproct *Echinidæ*.
 - = Oral notches deeper than broad; 2 ocular plates reaching the periproct *Tripeustidæ*.
 - ‡‡ More than 3 pairs of pores on each arc.
 - *Toxopeustidæ*.
 - †† Body elliptical *Echinometridæ*.

C. K. HOFFMANN ("Zur Anatomie der Echinen und Spatangien," Niederl. Arch. Zool. i. pp. 11-112, pls. 3-10) treats of the external structure and the reproductive and vascular systems; and compares the structure of the *Echinodermata* with that of the worms. A second paper is promised, on the *Asteridæ* and *Ophiuridæ*.

Cidaris. C. Stewart ("On the Minute Structure of certain Hard Parts of the genus *Cidaris*," Q. J. Micr. Sci. xi. pp. 51-55, pl. 4) arrives at the following results:—The spines of the recent *Cidaridæ* are characterized by the dense crust which terminates their growth; the pedicellariæ by the special chamber found in each jaw, and by the calcareous stem divided into 2 parts, the upper being in immediate contact with the head; the ambulacral tubes by being surrounded by the concentrically curved spicules, which give them a ringed appearance. These characters are common and peculiar to all recent *Cidaridæ*. (The fossil species are not considered, as they do not admit of a complete and satisfactory examination.) The ovary, strengthened by triangular plate-like or radiate spicules (the former most abundant), but not retaining the form of its component tubules, in the dry state also affords a constant feature, peculiar to this genus.

Echinocidaris punctulata, Desm., and *Laganum decagonale*, Less., photographed by A. Agassiz, Bull. Mus. C. Z. 1871.

Crustulum, Troschel, = *Astrichypeus*, Verrill; but *C. gratulans*, Tr., may be distinct from *A. manni*, Verr. : Troschel, SB. Ver. Rheinl. xxvi. p. 15.

Echinoneus. Perrier's observations on the pedicellariæ and ambulacra (Ann. Sc. Nat. xiv.; cf. Zool. Rec. vii. pp. 482, 485) are translated, Ann. N. H. (4) viii. pp. 214 & 215.

Echinus. For a popular account of structure, with remarks on the characters and position of the groups of the *Echinodermata*, cf. St. George Mivart, Pop. Sc. Rev. ix. pp. 366-377, pl. 55.

Spatangus raschi, Lovén (cf. Zool. Rec. vi. p. 648). Lovén's paper on this species was republished, Cefv. Vet. Ak. 1869, pp. 733-735, pl. 13. He adds full synonymy and references to *S. purpureus*, Müll.

Amphidotus cordatus. Structure and habits, cf. D. Robertson, Q. J. Micr. Sci. xi. pp. 25-27.

Evechinus, g. n., Verrill, Tr. Conn. Ac. i. p. 583. Test thick, circular, thickly covered with tubercles of various sizes. Spines rather short, tapering, very unequal. Ambulacral zones with 2 principal rows of large tubercles; poriferous zones not widened below; pores beneath near the actinal areas arranged in obliquely transverse groups of 3 pairs, soon becoming irregular, inner ones separated from the others by a vertical row of tubercles, so that throughout the greater part of the extent of the zones, both above and below, the pores form an inner, nearly regular, vertical row, and 2 irregularly alternating rows, of which the outer is more regular than the median row; pores arranged in the latter in a more or less zigzag line. Actinal area small, with shallow cuts; membrane thin, bearing a few scattered, rounded, granulated plates; the larger plates near the mouth bear minute spines and very small oval pedicellariæ. Anal area covered by an outer circle of 8 to 10 larger, often spine-bearing plates, and an inner converging cluster of smaller plates. Differs from *Psammechinus* in the arrangement of the pores, and the few and distant plates of the actinal membrane: *Boletia* has a thin test, deeper actinal cuts, and no tubercles in the middle of the interambulacral areas above, &c. *Heliocidaris* differs in the arrangement of pores, and the zones are expanded beneath. Type *Echinus chloroticus*, Verrill (= *Boletia viridis*, Verrill, which comes from New Zealand, not Peru).

Pseudoboletia, g. n., Troschel, SB. Ver. Rheinl. xxvi. p. 96. Shell smooth, convex, thinly scaled; tubercles small, always four pairs of pores in each arc; 2 eye-plates extending to the periproct; peristoma with rather deep notches; oral apertures with a large opening and weaker connecting edges. Distinguished from *Boletia* by the 4 pairs of pores in each arc. Types *P. stenostoma* and *maculata*, spp. nn., *id. l. c.*, New Holland.

Echinocardium pennatifidum, sp. n., D. Robertson, P. N. H. Soc. Glasg. i. p. 99, Cumbrae, Durham; figured by Hodge, Tr. North. Durh. iv. pl. 5. fig. 1.

Plagionotus africanus, sp. n., Verrill, *l. c.* p. 569, Sherborough Island, W. Africa.

Podophora quadriseriata, sp. n., Troschel, *l. c.* xxvi. p. 96.

HOLOTHUROIDEA.

Cucumaria pentactes, from Firth of Clyde, briefly described, and spicule figured, by Brady & Robertson, P. Z. S. 1871, p. 691, pl. 71. figs. 5 & 6.

Phascolosomum elongatum, in dying, sometimes inflates and contracts its body in different parts, and preserves this attitude. It is therefore probable that *Sipunculus deformis*, Baird, from Australia, may be only a specimen of some known species which has died under similar circumstances. Grube, JB. schles. Ges. xlvii. pp. 70 & 71.

Cucumaria saxicola, sp. n., Brady & Robertson, P. Z. S. 1871, p. 690, pl. 72, coasts of Mayo and Galway.

Synapta tenera (Norman), Brady & Robertson, P. Z. S. 1871, p. 690, pl. 71. figs. 1-4, Firth of Clyde; *S. roseola*, Schmarda, Zoologie, i. p. 260, f. 180, Indian Ocean: spp. nn.

CŒLENTERATA

BY

RAMSAY H. TRAQUAIR, M.D., and W. F. KIRBY, M.E.S. &c.

SCHMARDA (Zoologie, i. pp. 200-233) proposes the following arrangement :—

ANTHOZOA.

CNIDARIA. *Alcyonaria*: Alcyonida (Cornularina, Telestina, Xenina), Tubiporida, Gorgonida, Isidida, Corallida, Pennatulida, inc. sed. Graptolitida. *Zoantharia*: (1) *Antipatharia*; (2) *Malacodermata*—Cerianthida, Zoanthida, Actinida. *Madreporaria*: (1) *Rugosa*—Cystiphyllida, Cyathophyllida, Cyathaxonida, Staurida (fossil); (2) *Tabulata*—Milleporida, Seriatoporida, Favositida (Chætetina, Halysitina, Favositina, fossil; Pocilloporina), Thecida; (3) *Tubulosa*—Auloporida (fossil); (4) *Perforata*—Madreporida (Eupsamina, Madreporina, Turbinarina), Poritida (Poritina, Montiporina); (5) *Aporosa*—Turbinolida (Caryophyllina, Turbinolina), Dasmiida, Oculinida (Oculinina, Stylasterina), Stylophorida, Astræida (Eusmilina: *Trochomilia*, *Euphyllacea*, *Stylinacea*. Astræina: *Lithophylliacea*, *Faviacea*, *Astræacea*, *Cladocoracea*, *Astrangiacea*), Echinoporida, Merulinida, Fungida (Fungina: *Fungiacea*, *Anabaceacea*. Lophoserina).

PODACTINARIA. Lucernarida.

HYDRÆ.

MEDUSÆ.

SIPHONOPHORA. Velellida, Physalida, Physophorida, Hippopodiida, Diphyida.

DISCOPHORA. (1) *Cryptocarpæ*—Oceanida, Thaumantiida, Encopida, Æquoriida, Geryonida, Trachynemida, Æginida; (2) *Phanerocarpæ*—Rhizostomida, Medusida, Pelagiida, Charybdæida.

CTENOPHORA. (1) *Eurytomata*—Beroida, Neisida, Rangiida; (2) *Saccata*—Callianirida, Mertensida, Cydippida; (3) *Teniatæ*; (4) *Lobata*—Callymmda, Mnemiida, Eurhamphæida, Bolinida.

ALLMAN ("On the Homological Relations of the Cœlenterata," Tr. R. Soc. Edinb. xxvi. pp. 459-466, woodcuts; also (abstract) Pr. R. Soc. Edinb. vii. pp. 512, 513) asserts that a homological agreement should be traceable between the parts of animals included in the various sections of the *Cœlenterata*. He first points out the structural analogies between a *Hydra* and an *Actinia*, then compares the *Siphonophora* and *Hydroidea*, and, finally, discusses the

structure and affinities of the *Ctenophora*, which he maintains to be truly *Hydrozoa*.

The structure of the operculum in recent and fossil corals of the genera *Goniophyllum*, *Calceola*, *Rhizophyllum*, *Prinnoa*, *Paramuricea*, *Calyptrophora*, *Cyathophyllum*, and *Cystiphyllum* is compared by G. Lindström, *Öfv. Vet. Ak.* xxvii. pp. 921-926. In *Goniophyllum pyramidale* the operculum is formed of 4 valves, and the bottom one is analogous to the single lid of *Calceola* and *Rhizophyllum*. *Cystiphyllum prismaticum* is accustomed to shed its operculum and form a new one; and the calyx is closed by several opercular valves. In *Prinnoa* and *Paramuricea* there are sometimes 8 valves. He regards the opercula of corals as formations of an exothecal nature, to some extent homologous with the small scales in the fossil *Cyathophyllum loveni*, M.-Edw. & H. (*Pholidophyllum*, n. g., Lindström, p. 925, note), and possibly also with the scales and opercular valves of *Prinnoa*.

SCHNEIDER & RÖTTGEN, SB. oberhess. Ges., March 1871, transl. Ann. N. II. (4) vii. pp. 437-441, have published their observations on the structure of the *Actinie* and corals. In the *Hexactinie* the septa always stand in pairs; and 3 kinds may be distinguished, both by the measure of their radial diameter and by their structure. Some or all bear very prominent, thick longitudinal muscles, which it is proposed to call "vanes," on their inner or outer surfaces. In the *Octactinie* the septa are not placed in pairs; and their vanes are differently arranged. Our knowledge of the calcareous lamellæ of the corals is still very unsatisfactory. The *Hexactinie* all possess an annular canal, which closely surrounds the mouth (which must not be confounded with the apertures of the septa), by which they approach the *Medusæ* more closely than has hitherto been supposed. The so-called "bourses marginales" of HOLLARD prove to be compound eyes, the structure of which is described. The muscular structure is too fully described to admit of abridgment.

T. HINCKS, in a "Supplement to a Catalogue of the Zoophytes of South Devon and South Cornwall," Ann. N. II. (4) viii. pp. 73-83, pls. 5 & 6, records 265 species (including *Polyzoa*) as occurring in the district, as against 241 known in 1861-1862. *Syncoryne eximia*, *Calycella fastigiata*, and *Halecium sessile*, only known previously from N.E. England and W. Scotland, are among the most interesting discoveries.

For list of zoophytes found at Portpatrick, cf. J. Grieve & D. Robertson, P. N. II. Soc. Glasg. i. pp. 33 & 34.

A few zoophytes dredged off the Blasket Islands, on the Irish coast, are noticed by W. Andrews, J. R. Dubl. Soc. v. p. 479.

The Sponges, Polypes, &c. obtained by the yacht 'Norna' off Spain and Portugal are briefly noticed by W. S. Kent in 'Nature,' and quoted in Am. J. Sc. (3) ii. pp. 385-387.

On various Zoophytes, Echinoderms, &c. in the aquarium at Pest, cf. K. János, Term. Közl. 1869, pp. 22-29.

An extraordinary parasite on the eggs of the Sterlet, resembling a fresh-water polyp, is described and figured by P. Owsjannikow, Bull. Pétersb. xvii. pp. 104-108.

For a popular paper, noticing the principal forms of animal life observed on the coral-reefs of the Red Sea, cf. C. B. Klunzinger, Verh. z.-b. Wien, xx. pp. 389-394.

On a few Zoophytes from Mozambique, *cf.* Bianconi, Mem. Ac. Bologn. ix. pp. 211-214.

E. van Beneden uses weak osmic acid to preserve *Medusæ* and *Ctenophora*, and concentrated solution of picric acid for small *Medusæ* (*Oceania*) and *Noctiluca*. Ann. Sc. Nat. (5) xv. no. 9, pp. 2; Bull. Ac. Belg. xxxii. pp. 179-181.

Schulze & Wittich preserve *Hydræ*, *Medusæ*, &c. by allowing them to expand perfectly, and then adding a quantity of osmic acid suddenly to the water, which kills them before they have time to close. They must be taken out immediately, washed with distilled water, slightly tinted with carmine, and then preserved in spirit of 52°. Rostocker Tageblatt, 1871, p. 53; *cf.* Z. ges. Naturw. (2) iv. pp. 282 & 283.

Glass models of *Cælienterata* &c., made by Blaschke, of Dresden, are mentioned by Troschel, SB. Ver. Rheinl. xxviii. p. 78.

HYDROZOA.

HYDROIDA.

E. J. ALLMAN has published a monograph of the Gymnoblasic or Tubularian Hydroids (Ray Society, London: 1871. Part I. The Hydroida in General. Royal 4to, pp. xxii, & 154, pls. 1-12). This important work, the result of many years' patient and enthusiastic investigation, is preceded by a very full and clear glossary of the terms employed, which, however, are too numerous to be noticed and defined in detail. The author adopts the following divisions of the *Cælienterata* :—

CÆLENTERATA.	{	ACTINOZOA.	{	Ctenophora.
		HYDROZOA.		Discophora.
				Lucernariæ.
				Hydroida.
				Siphonophora.

He awaits the result of further investigations before placing the tubulate and rugose corals among the *Hydrozoa*, as proposed by Agassiz. A full history of the progress of the study of the *Hydroida* is then given; and the remainder of the present part of the work contains a very full account, illustrated by numerous woodcuts, of their morphology and physiology. Under the term "zooids" he would include not only the free medusiform buds of the *Hydroida*, but also the fixed hydranths and gonophores, which never attain a developed medusiform structure, as well as the simple generative sacs developed on the radiating canals of *Obelia*, *Thaumantias*, &c.; whereas he rigidly excludes all mere organs, however capable they may be of temporary self-mainte-

nance, such as the hectocotylus of some Cephalopoda. The alimentary zooids of the *Hydroida* he calls hydranths, Huxley's name of polypite being practically identical with polypide, used for the extensile and retractile portion of a polyzoon. The trophosomes of the N.-American *Nemopsis* and *Acaulis*, which have been found floating free in the sea, are probably only the detached hydranths of fixed forms; and the statement that *Acaulis* subsequently becomes fixed is almost certainly erroneous. The *Hydroida* may be divided into two primary sections:—the Calyptoblastic, which possess a gonangium and hydrotheca; and the Gymnoblasic, which (except the freshwater *Hydræ*, forming a separate section) do not. The entire life-series of the *Hydroida* may be summed up in two fundamental propositions:—(1) The fixed plant-like *Hydroida* give origin to sexual buds, both in the form of closed sacs (the sporosac), which develop within them the generative elements, and in that of a more specialized form of bud, which becomes a free (rarely fixed) *Medusa*, ultimately attaining, either directly or indirectly, sexual maturity, and producing ova or spermatozoa. (2) The ova of the medusiform bud, like those of the sporosac, undergo a continuous development, by which they become transformed into hydri-form trophosomes, ultimately giving origin, by buds, to *Medusæ* identical with those from the ova of which the trophosome was directly developed.

The following species are figured, highly magnified, and accompanied with numerous details, chiefly anatomical:—*Clava squamata*, *multicornis*, and *diffusa*, *Tubiclava fruticosa* and *lucerna*, *Cordylophora lacustris*, *Coryne pusilla* and *vaginata*, *Syncoryne eximia*, *pulchella*, and *frutescens*, *Gemellaria implexa*, *Dicoryne conferta*, *Bougainvillia fruticosa*, *ramosa*, *britannica*, and *muscus*, *Heterocordyle conybearii*, *Perigonimus vestitus*, *minutus*, and *serpens*, *Bimeria vestita*, and *Garveia nutans*.

Cordylophora lacustris. F. E. Schulze ('Über den Bau und die Entwicklung von *Cordylophora lacustris*, Allman, nebst Bemerkungen über Vorkommen und Lebensweise dieses Thieres.' 4to. Leipzig: 1871, pp. 52, 6 plates) has published a very complete monograph, giving its entire structure, anatomy, distribution, &c. He considers it identical with *Tubularia cornea*, Agardh (1816), but prefers retaining Allman's name, though later. An abstract is given, Z. ges. Naturw. (2) iv. pp. 493–496.

Clytia (Campanularia) volubilis. The full development of its different stages described and roughly figured by G. Du Plessis, Bull. Soc. Vaud. (2) xi. pp. 167–170, pl. 2.

Lovenella, Hincks. The author adds the description of the gonothecæ and gonozoid to the characters of this genus, and figures and remarks on the development of *L. clausa*, Lovén: Ann. N. H. (4) viii. pp. 79 & 80.

Coppinia arcta. Structure fully described, and revision of generic characters given by Allman, l. c. pp. 55 & 56.

Hydra carnea, Ag. On its occurrence in Lake Superior, cf. Smith & Verrill, Am. J. Sc. (3) ii. p. 448.

New genera and species :—

Actinogonium, Allman, *l. c.* p. 95. Gonophores giving origin to actinuloid bodies, shaped like a cuttlefish with four arms, and hydroid—consequently developing from an actinula instead of from a planula. Type *Syncoryne pusilla*, Van Beneden (nec *Coryne pusilla*, Gaertner).

Gymnocoryne, Hincks, *l. c.* p. 75. Polypites clavate, sessile, rising immediately from a filiform stolon, invested by a delicate chitinous polypary; tentacula clavate, very numerous, the uppermost furnished with large capitula, and forming a circle round the oral extremity, the rest scattered over nearly the whole of the body. Type *G. coronata*, *id. l. c.* p. 76, pl. 5. figs. 1 & 1a, Salcombe Bay.

Cladocoryne, W. D. Rotch, Ann. N. H. (4) vii. p. 227. Allied to *Zanclea*; intermediate between the *Corynidae* and *Staurikiidae*. Stem simple or branched, rooted by a creeping filiform stolon, the whole sheathed in a thin chitinous tube, smooth or very sparingly annulated. Polypites terminal, clavate, with simple and branched capitate tentacula; the former set in a single row round the mouth, the latter in several whorls round the body, and multicapitate; with a prominent tubercle composed of thread-cells between each tentacle in the anterior and in the posterior rows. Reproduction unknown. Type *C. floccosa*, *id. l. c.* p. 228, Herm, near Guernsey.

Schizocladium, Allman, Q. J. Micr. Sci. xi. p. 18. *Campanularidae*, allied to *Obelia*. Trophosome: hydrocaulus rooted, branching, carrying besides the hydranth-bearing ramuli, others (fissiparous appendages) which spring from various parts of the hydrocaulus, and are cylindrical, simple, and never support either a hydranth or a generative bud. Hydrothecæ with inoperculate orifice. Gonosome unknown. Type *S. ramosum*, *id. l. c.* pl. 2, Loch Long, Scotland, attached to buoys. (Its mode of reproduction by a fission-frustule is fully described.)

Campanularia calculifera, Hincks, *l. c.* p. 78, pl. 6, Salcombe Bay.

SIPHONOPHORA.

The stomachic cavity of some *Siphonophora* is lined with cilia, which appear to be intended to pump fluid into a system of vacuola. Figures are given of portions of the internal structure of *Apolesia contorta* and *uaria*, *Forskalia edwardsi*, *Diphyes*, sp., and *Hippopodius neapolitanus*. W. Donitz, Arch. Anat. Phys. 1871, pp. 83-89, pl. 3.

Hippopodius gleba. Young larva described by E. Metschnikoff, Bull. Pétersb. xv. p. 503.

Veella spirans. On the structure of its medusid germ, cf. A. Stuart, Nachr. Ges. Götting. 1870, pp. 101 & 102. There is an internal cavity separate from the stomach, which opens further into the canals of the vascular system. [Cf. Zool. Rec. vii. p. 490.]

DISCOPHORA.

Aurelia aurita. On its development from the embryo form formerly known as *Strobila*, cf. F. E. Schulze, Arch. Ver. Mecklenb. xxiii. pp. 205-208.

A. BRANDT ("Ueber fossile Medusen," Mém. Pétersb. xvi. no. 11, p. 28,

2 plates) notices *Rhizostomites admirandus* and *lithographicus*, and *Leptobrachites trigonobrachius*, Häck., from the Solenhofen slate. He renames the last species *Pelagiopsis leuckarti*.

ACTINOZOA.

ALCYONIARIA.

Alcyoniidæ.

Alcyonium digitatum, *palmatum*, and a third, undetermined species. A very detailed account of their anatomy is given by G. Pouchet and A. Myèvre, J. de l'Anat. vii. pp. 221-223, 285-315, pls. 4-7 and woodcuts. The first paper is reprinted from C. R. lxi. pp. 1097-1099 (*cf.* Zool. Rec. vi. p. 652).

Pennatulidæ.

Renilla. A concise summary of the structural characteristics of this group, arranged under 16 heads, is given by A. Kölliker, Verh. Ges. Würz. (2) ii. pp. 108-111, translated in Ann. N. H. (4) vii. pp. 307-309.

Pseudogorgia godeffroyi, n. g. & s., Kölliker, l. c. pp. 20-28, pl. 4. f. 9-19, l. c. SB. pp. vii & viii, Gulf St. Vincent. Polyps arranged in simple rows on the stem, slightly diverging from a straight line at intervals, each rising from a small warty projection of the sarcosoma, as in the undeveloped basins of *Paragorgia*; mouth of the warts apparently closed by 8 round lobes. No trace of an internal horny or calcareous axis, but a broad central canal, which is simply a prolongation of the internal cavity of an outstanding polyp, placed near the extremity of the stem, with tentacles probably smaller than the others. Mesenterial filaments arranged under the stomach, as in the *Pennatulidæ*; two long and narrow, the others short and thicker. The first extend throughout the whole polyparium, while those next to them are produced into narrow septula. The septa bearing the long filaments are not always quite symmetrically arranged on the ventral side of the polyparium. Opposite to these stand two dorsal septula, rather thicker than the others between the dorsal and lateral ventral septa, which may be called the *central* and *dorsal lateral septula*. Sarcosoma without layers of muscles in the body-wall, but with an unusual development of the finer digestive tubes.

Probably a primordial form of the *Pennatulidæ*, nearly related to the *Alcyoniidæ* and *Gorgoniidæ*. (Another new genus, *Cælogorgia*, is mentioned but not described, which combines the characters of the *Alcyoniidæ* and *Gorgoniidæ*.)

Renilla muelleri, sp. n., M. Schultze, SB. Ver. Rheinl. xxviii. p. 37, Brazil.

Gorgoniidæ.

For a popular account of the coral-fishery in the Mediterranean, *cf.* Molin, Schr. Ver. nat. Wien, x. pp. 429-458.

Callicella elegans, Gray, appears to belong rather to the *Primnoidæ* than to the *Calligorgoniidæ*. E. P. Wright, Q. J. Micr. Sci. xi. p. 319.

A. KÖLLIKER, l. c. ii. pp. 11-20, considers the genus *Spongioderma* to belong to the *Gorgoniidæ*—*Briareaceæ*, and to come nearest to *Titanideum*, Ag. He revises the characters of *Spongioderma* as follows:—Axis very sharply

bounded ; epidermis composed of an external hard and internal soft layer, with many larger and smaller nutritive vessels. Polyps contained in the larger warts of the epidermis. Spicules of the axis long, those of the epidermis short, forming 4-, 5-, 6-, and 8-rayed bodies, with warty extremities (*Homophyton*, Gray, ? = *Spongioderma*). Type *Solanderia verrucosa*, Möb. *Sol. gracilis* (pl. 2. figs. 1 & 2), Duch. & Mich., is not a *Gorgonia*, but probably a sponge. *Sol. frauenfeldi*, Köll., is a *Spongioderma*. *Titanideum suberosum*, Ag., is described and figured, p. 16, pl. 3. f. 3. He adds the following table of the *Briareaceæ*, which he defines as *Gorgoniidæ* with no horny axis, their internal parts composed of solid calcareous spicules :—

I. SYMPODIDA.

Sarcosoma incrusting. *Sympodium*, *Erythropodium*, Köll.

(The genus *Ojeda*, Duch. & Mich., does not belong here, but is truly a *Didemnum*.)

II. PARAGORGIACEÆ.

Sarcosoma branching, divided into an outer layer and inner nucleus.

1. Internal mass without additional nutritive vessels. *Titanideum*, Ag., *Spongioderma*, Köll.

(*Briareum grandiflorum*, Sars, will probably form a new genus in this subdivision.)

2. Internal mass with larger nutritive canals.

A. Polyps wholly retractile within the sarcosoma.

1. *Briareum*. Polyps without calyx, arranged regularly on the stem. *B. suberosum*, Dana; *B. palmachristi*, D. & M.; ? *B. gorgonidium*, Bl.

2. *Paragorgia*. Polyps with wart-like calyces, irregularly arranged.

B. Polyps only partially retractile.

1. *Solenogorgia*, Genth. Stem gutter- or pipe-shaped.
2. *Semperina*, Köll. Stem cylindrical.

Semperina rubra, n. g. & sp., Kölliker, *l. c.* pp. 17–19, pl. 3. figs. 4–8, Bohel. (Described in too great detail for its characters to admit of abridgment.)

ZOANTHARIA.

MALACODERMATA.

D. ROBERTSON records *Edwardsia carnea* and *callimorpha*, *Peachia hastata*, *Cerianthus lloydi*, and *Halcampa chrysanthella* as new to Scotland. P. N. H. Soc. Glasg. pp. 45–73.

Edwardsia vestita. On its habits in confinement, cf. W. R. Hughes, P. Soc. Birmingham. 1869, pp. 39–42, with plate.

Xantiopus, Kef. E. Metschnikoff (Bull. Pétersb. xv. p. 502) describes two species of the larval genus *Calliphobe* observed at Spezia, which appear to belong to the *Edwardsiæ*, and to be nearest related to *Xantiopus*.

SCLEROBASICA.

Antipathes lenta, sp. n., Pourtales, 'Catalogue of Corals,' p. 55, Carysfoot

Reef and Tortugas, 35-37 fath.; *A. arctica*, sp. n., Lütken, Overs. Dan. Selsk. 1871, pp. 18-26, fig., N. Greenland, found in stomach of a shark (*Scymnus microcephalus*). Chiefly remarkable as a representative of a group which, until its discovery in the British seas by Wyville Thomson, was not thought to extend further north than the Mediterranean and S. Carolina. A brief notice is added of the distribution of the allied species, and of the depths at which they occur.

MADREPORARIA.

L. F. DE POURTALES (Illustrated Catalogue of the Museum of Comparative Zoology at Harvard College. No. IV. Deep-sea Corals. Cambridge, U.S. Roy. 8vo, 1871, pp. 93, 7 plates and map) gives a detailed account of the specimens obtained by the U.S. Coast Survey for the exploration of the Gulf-stream, in 1867-1869. The following known species (nearly all previously described by himself in Bull. Mus. Comp. Zool.) are figured:—*Caryophyllia formosa*, pl. 1. fig. 16; *C. corniformis*, figs. 14, 15; *Paracyathus confertus*, pl. 6. figs. 11-13 (also found at the Azores); *Leptocyathus stimpsoni*, pl. 3. figs. 1-3; *Thecocyathus cylindraceus*, pl. 2. figs. 14 & 15; *Trochocyathus* (?) *coronatus*, pl. 6. fig. 16; *Deltocyathus agassizi*, pl. 2. figs. 1-5, pl. 5. figs. 9 & 10; *D. caileti*, Duch. & Mich. pl. 1. figs. 17 & 18; *Rhizotrochus fragilis*, pl. 4. figs. 1-4; *Oculina varicosa*, Les., pl. 6. figs. 3 & 4; *Diplohelia profunda*, pl. 6. figs. 6 & 7; *Lophohelia prolifera*, M.-Edw. & H. (= *L. affinis*, Pourt., olim); *Madracia asperula*, M.-Edw. & H., pl. 7. fig. 4; *M. decactis*, Verr., figs. 1-3; *Stylaster erubescens*, pl. 4. figs. 10 & 11; *S. complanatus*, pl. 2. figs. 16 & 17; *Cryptohelia peireii*, figs. 18 & 19; *Allopora miniata*, pl. 3. figs. 14-16; *Distichopora sulcata*, pl. 4. fig. 14, pl. 7. fig. 7; *D. foliacea*, pl. 4. figs. 12 & 13; *Errhina carinata*, pl. 6. fig. 5; *Balanophyllia floridana*, pl. 4. figs. 5 & 6; *Thecopsammia tintinnabulum*, pl. 1. figs. 9-11; *T. socialis*, pl. 2. figs. 9 & 10; *Diaseris pusilla*, figs. 6-8; *Phiobothrus symmetricus*, pl. 4. figs. 7 & 8; *P. tubulatus*, fig. 9.

Pourtales (*l. c.*) rejects as unnatural the division of the *Turbinolidæ* into the subfamilies *Caryophyllinæ* and *Turbinolinæ*, characterized by the presence or absence of pali. The group *Trochosmiliaceæ*, M.-Edw. & H., is raised into a family, *Trochosmilidæ* (p. 18), differing from the *Turbinolidæ* in the presence of dissepiments closing the interseptal chambers. The *Stylophorinæ* or *Pseudoculinæ*, M.-Edw. & H., are also raised into a family, *Stylophoridæ* (p. 26), but no characters are given. The following table of the genera of *Stylasteridæ* is given:—

STYLASTERIDÆ.	{	With distinct septa.	{	Gemination alternate.	{	Callicles regular.
						<i>Stylaster</i> .
						Callicles labiate.
						<i>Cryptohelia</i> .
	{	Septa obliterated, interseptal chambers distinct from fossa.	{	Gemination irregular.	{	<i>Allopora</i> .
						Callicles confluent on edge of corallum
						<i>Distichopora</i> .
						Callicles labiate
						<i>Lepidopora</i> .
						Callicles without lip. <i>Errhina</i> .

The Catalogue ends with tables of geographical and bathymetrical distribution, and a list of Reef Corals.

The researches of Agassiz and Pourtales on Madrepores &c. are noticed, Arch. Sci. Nat. xli. pp. 90-94.

W. S. KENT ("On some new and little-known species of Madreporae or Stony Corals in the British-Museum Collection," P. Z. S. 1871, pp. 275-286, pls. 23-25) notices *Amphihelia infundibulifera*, Lamk., p. 276, pl. 24. figs. 4, 4a, b, from Formosa; *Stenohelia maderensis*, Johnst., p. 277, pl. 24. figs. 3, 3a-c, from Madeira and Cape Verd; *Stylaster eximius*, new name for *S. elegans*, Michelotti, nec Verrill, p. 277; *Allopora*, Ehr., is recharacterized; *A. oculata*, Duncan, is a *Stylaster*, pp. 278-281; *Errhina*, Gray, is recharacterized; *E. cochleata*, *glabra*, and *aspera* (nec *aspera*, Esp., Gray, the type of *Errhina*), Pourtales, belong to *Pentalophora*, Kent, new name for *Reussia*, Michelotti [preoccupied in fossil ferns], pp. 282 & 283. *Oxypora* [as *Oxyporus*, long preoccupied in *Coleoptera*], Kent, is proposed for *Trachypora*, Verrill, preoccupied in *Cyathophyllidae*, p. 283.

On the poisonous nature of living corals, especially the madreporae, due to the darts in the lasso cells, cf. Packard, Bull. Ess. Inst. ii. p. 44.

RUGOSA.

Gwynia annulata, Dunc., belongs to the *Rugosa*, fam. *Cyathaxonidae*. The Australian genus *Conosmilia* is allied to the *Stauridae*, and especially to the Permian genus *Polycalia*. The palæozoic and neozoic faunas can no longer be considered distinct. P. M. Duncan, P. R. Soc. xix. pp. 450 & 451 (abstract).

APOROSA.

Turbinoliidae.

Caryophyllia cylindracea, Reuss. On its discovery by Carpenter and Jeffreys in 1095 fathoms, off the coast of Portugal, and on the recent discoveries of other corals, supposed to be extinct, in a living state, cf. P. M. Duncan, J. G. Soc. xxvii. pp. 434-439.

Stenocyathus, g. n., Pourtales, Ill. Cat. p. 9. Corallum simple, free, very elongated, and of nearly equal diameter throughout; a single crown of pali; a columella of one or more twisted processes; no epitheca. Type *Cænocyathus vermiformis*, Pourt., pl. 1. figs. 1 & 2, pl. 3. figs. 11-13.

New species :—

Acanthocyathus spiniger, Kent, P. Z. S. 1871, p. 275, pl. 23. figs. 1, 1a-c, Japan.

Theocyathus laevigatus, Pourtales, l. c. p. 14, pl. 5. figs. 3 & 4, Florida Reef, Double-headed Shot Keys, 100-315 fath.

Desmophyllum solidum, id. l. c. p. 17, pl. 5. figs. 5 & 6, Double-headed Shot Keys, 315 fath.

Ceratocyathus prolifer, id. l. c. p. 19, pl. 3. figs. 8-10, French Reef, 45 fath.

Flabellum matricidum, Kent, l. c. p. 276, pl. 23. figs. 2 & 2a-c, Japan.

Oculinidae.

Colangia, g. n., Pourtales, l. c. p. 31. Allied to *Phalangia*. Corallum immersed in an expanded epithecal membrane, forming several successive stories, following the growth of the coral. Primary and secondary septa entire; those of the lower cycles denticulate. Well-developed pali in front

of the tertiaries. Columella lamellar or papillose, not much developed. Type *C. immersa*, sp. n., *id. l. c.*, a shallow-water form, on reefs.

Lepidopora, g. n., Pourtales, *l. c.* p. 40. Corallum finely branching, inter-septal chambers separate from calicles in the shape of split tubercles; lip of calicle projecting as a scale above it. To contain *Errhina glabra*, Pourt., pl. 7, figs. 8 & 9; *E. cochleata*, Pourt., pl. 3, figs. 17-19; and *L. dabneyi*, sp. n., *id. l. c.* p. 41, pl. 7, figs. 10 & 11, Fayal (= *Errhina aspera*, Pourtales, *nec* Gray).

New species :—

Oculina tenella, p. 23, pl. 5, figs. 11 & 12, and *O. robusta*, p. 66, Tortugas, Florida: Pourtales, *l. c.*

Lophohelia exigua, pl. 1, figs. 6 & 7, Tortugas, 36-79 fath.; *L. carolina*, p. 26, Havana: *id. l. c.*

Stylaster filigranus, p. 35, pl. 5, figs. 13 & 14, west of Tortugas, *duchas-saingi* (= *S. elegans*, Duch. & Mich., preoccupied), p. 35, pl. 6, figs. 1 & 2, *punctatus*, p. 36, Orange Key, 9 fath., and Double-headed Shot Keys, 315 fath., *id. l. c.*; *S. amphiheloides*, Cape of Good Hope, *asper*, hab. —?, Kent, *l. c.* pp. 277 & 278, pl. 24, figs. 1 & 1a-c & 2 & 2a.

Allopora nobilis, p. 279, *cuplanata*, p. 280, pl. 25, figs. 2 & 2a-c, *subviolacea*, *ibid.* figs. 1 & 1a, hab. —?: Kent, *l. c.*

Distichopora cervina, Pourtales, *l. c.* p. 39, note, St. Thomas; *D. rosea*, Kent, *l. c.* p. 281, 1st coast of Australia.

Astræidæ.

New species :—

Parasmilia lymani, p. 20, pl. 6, figs. 8-10, Elbow, Couch, and Alligator Reefs, 70-147 fath., *variegata*, p. 21, pl. 1, fig. 13, Couch and Carysfoot Reefs, 63-77 fath.: Pourtales, *l. c.*

Celosmilia fecunda, *id. l. c.* p. 21, pl. 1, fig. 12, pl. 3, figs. 4 & 5, pl. 6, figs. 14 & 15, Tortugas, Havana, and Double-headed Shot Keys, 68-315 fath.

Astrocænia pectinata, *id. l. c.* p. 69, on base of a *Madrepora prolifera* in Mus. Comp. Zool.

Galaxea eburnea, *id. l. c.* p. 29, pl. 3, figs. 6 & 7, Havana, 270 fath.

Tridacophyllia alcornis and *echinata*, Kent, *l. c.* p. 283, pl. 23, figs. 4 & 3, San Cristoval, Solomon Islands.

Cladocora brevis, Pourtales, *l. c.* p. 78, Florida Reef.

Fungiidæ.

Fungia symmetrica, sp. n., Pourtales, *l. c.* p. 46, pl. 7, figs. 5 & 6, Carysfoot Reef and Cojima, Cuba, 350-450 fath.

Diaseris crispa, sp. n., *id. l. c.* p. 47, pl. 5, figs. 1 & 2, Land Key, Alligator and Tennessee Reefs, 119-189 fath.

Leptoseris striatus, sp. n., Kent, *l. c.* p. 284, Borneo.

Haplophyllia paradoxa, sp. n., Pourtales, *l. c.* p. 52, pl. 2, figs. 11-13, Bahia, Honda, Florida, 324 fath.

PERFORATA.

*Madreporidæ.**New species :—*

Balanophyllia imperialis, Singapore, p. 284, pl. 23. figs. 5, 5*a*, *b*; *malaccensis*, Malacca, p. 285: Kent, *l. c.*

Dendrophyllia cornucopia, p. 45, pl. 5. figs. 7 & 8, Key West, 120–125 fath., *cyathoides*, *ibid.* pl. 1. figs. 8 & 9, Havana, 270 fath.: Pourtales, *l. c.*

Turbinaria parvistella, Kent, *l. c.* p. 285, hab. — ?

PROTOZOA

BY

RAMSAY H. TRAQUAIR, M.D., and W. F. KIRBY, M.E.S. &c.

J. D. MACDONALD, Ann. N. H. (4) viii. pp. 221-223, proposes the following classification of the *Invertebrata*, founded upon the progressive-development theory:—

Protozoa.			
Astomata.		Stomatoda.	
<i>Rhizopoda.</i>	<i>Gregarinidæ.</i>	<i>Infusoria.</i>	<i>Noctilucidæ.</i>
Cœlenterata.	Cestoidea.	Aprocta †.	Rotifera.
Molluscoida.	Nematoidea*.	Proctucha †.	Annelida.
Mollusca proper.	Trematoda.	Echinodermata.	Articulata.

SCHMARDA (Zoologie, i. pp. 156-199) classifies the *Sarcodea* (*Protozoa*) as follows:—

RHIZOPODA.

ATHALAMIA or RHIZOPODA NUDA: Amœbida, Actinophryida, Acinetida, inc. sed. Noctilucida.

RHIZOPODA IMPERFORATA: Gromida, Cornuspirida, Arcellida, Miliolida.

FORAMINIFERA: *Monothalamia*—Orbulinida; *Polythalamia*—Rotalida, Uvellingida, Textularida, Cassidulinida, Cristellarida, Nonionida, Peneroplida, Polystomellida, Borelida, Poritida, Orthocerinida, Conulinida, Acervulinida.

POLYCYSTINA.

RADIOLARIA MONOZOA or MONOCYTTARIA: Thalassicollida, Thalassosphærida, Aulacanthida, Acanthodesmida, Cyrtida, Ethmosphærida, Aulosphærida, Cladococcida, Acanthometrida, Diploconida, Ommatida, Spongurida, Discida, Lithelida.

RADIOLARIA POLYZOA or POLYCYTTARIA: Sphærozoida, Collosphærida.

INFUSORIA.

ASTOMATA: Cymozoida, Volvocida, Astasiida, Dinobryida, Phacida, Monadina, Cryptomonadina.

STOMATOPHORA: Peridiniida, Vorticellida, Trichodinida, Ophrydina,

* Including *Acanthocephala*.

† Turbellaria.

Ophryoscolecida, Cyclidina, Encheliida, Colepida, Trachelida, Ophryocercida, Colpodina, Bursariida, Stentorida, Oxytrichida, Euplotida, Aspidiscida.

SPONGIÆ.

SARCOSPONGIÆ.

CERAOSPONGIÆ: Spongiida, Hirciniida, Dysideida.

GUMMINEÆ.

HALICHONDRIÆ: Halichondriida, Clionida.

ACANTHOSPONGIÆ: Euplectellida, Esperida, Tethyida.

CORTICATA: Geodiida, Placospongiida.

CORALLIOSPONGIÆ: Dactylocalicida, Aphrocallistida.

POTAMOSPONGIÆ.

CALCISPONGIÆ.

M. JOHNSON ("Transmutation of Form in certain Protozoa," and "The Monad's Place in Nature," M. Micr. J. v. pp. 222-226; vi. pp. 184-191, 217-224, pls. 85, 100, 103) considers that monads are constant auxiliaries in the change of inorganic into organic matter. The so-called Brownian movements are probably due to the presence of life in some object too small for independent vision by the microscope. Under changed circumstances, a monad may become a *Chlorococcus*, an *Oscillatoria*, a *Lyngbya*, a moss, a lichen, an *Amæba*, or a *Mucedo*. *Actinophrys sol* is a phase of *Amæba*; and from an *Amæba*-form *Paramecium* can be observed to develop. *Paramecium* again constantly transforms to *Vorticella*, and thence to *Callidina elegans*. The whole of the lower forms of plant and animal life up to the *Infusoria* and *Rotifera* must be regarded as probably derivable from the same or similar lower forms.

T. C. HILGARD, "Infusorial Circuit of Generations," Am. J. Sc. (3) ii. pp. 20-25, 88-96; M. Micr. J. vi. pp. 227-233, 284, describes the appearance of *Vorticella* as an occasional parasite in *Protococcus*, and the development of the former into *Oxytricha*, *Paramecium*, and *Amæba*. Further development into *Planarie* and *Rotifera* may subsequently take place.

On protoplasm and cell-formation in *Myxomycetæ*, *Rhizopoda*, *Hydra*, &c., cf. Seubert & Ratzel, Verh. Ver. Karlsr. iii. pp. 11, 12, 47, 48.

F. CRACE-CALVERT has made experiments on the tenacity of protoplasmic life, which tell against spontaneous generation. All existing life in a solution is not completely destroyed by a less temperature than 400° F., continued for half an hour, and is scarcely affected by a temperature as low as 15° F. P. R. Soc. xix. pp. 468-476; Ann. N. H. (4) viii. pp. 63-66, 129-134; cf. Am. J. Sc. (3) ii. pp. 219, 220.

K. MÖBIUS believes that the presence of vegetable matter is as indispensable to the existence of animal life in the deep sea as elsewhere; and his observations show that decaying vegetable matter is always subsiding and depositing itself on the sea-bed, forming an appropriate basis for the nourishment of the deep-sea animals. "Wo kommt die Nahrung für die Tiefseethiere her?" Z. wiss. Zool. xxi. pp. 294-304; cf. Z. ges. Naturw. (2) iv. pp. 201-203; transl. Ann. N. H. (4) viii. pp. 193-203.

On reproduction in the lowest animals, cf. Giebel, Z. ges. Naturw. (2) iv. p. 505.

PERTY notices recent observations on the lowest organisms. Mitth. Ges. Bern, 1870, pp. 1-liv.

A. METZGER enumerates 1 *Myxocystodeum*, 3 *Spongiæ*, and 4 *Rhizopoda* as occurring on the E. Friesland coast: JB. Ges. Hannov. xx. pp. 35, 36. The species of *Rhizopoda* found by Ehrenberg and Harting in the mud of the rivers of the district are also enumerated.

SPONGIIDA.

H. A. PAGENSTECHER ("Zur Kenntniss der Schwämme," Verh. Ver. Heidelb. vi. pp. 1-66) reviews the principal works on Sponges and systems of classification (which he reproduces very fully) from Aristotle to the present time.

E. HÄCKEL ("Ueber die sexuelle Fortpflanzung und das natürliche System der Schwämme," Jen. Z. Nat. vi. pp. 641-651) mentions that the number of species of *Calcispongiæ* known to him in 1869 has now been more than doubled. During a visit to Dalmatia he has succeeded in detecting zoosperms in sponges of the groups *Ascones*, *Leucones*, and *Sycones*, and also in some siliceous sponges. The zoosperms of sponges are simply modified flagellated cells of the entoderm, the ciliated epithelial layer of cells which arises out of the inner germinal layer. Some cells of this layer retract their flagellum and become ova, others zoosperms; but in many calcareous sponges the zoosperms and zoospores can with difficulty be distinguished from each other. The development of the zoosperms, and the phenomena of conjugation are fully described. The sponges are hermaphrodite, zoosperms and ova always coexisting in the same individual. These observations establish the relationship of the sponges to the *Cœlenterata*, and completely disprove their supposed relationship to the sexless *Protista* or *Protozoa*. The flagellated sponge-particles of the entoderm of calcareous sponges frequently change into amœboid cells, and sometimes *vice versd*. Decided pseudopod formation takes place (only?) in the calcareous sponges, the ectoderm being sometimes covered with a thick down of extremely fine hairs, especially in the ectoderm-sheaths which enclose the isolated spicules. Häckel has also succeeded in discovering the natural system, *i. e.* the genealogical tree, of the calcareous sponges, and has been able to follow, step by step, the genesis of their species. All former systems are artificial; but Häckel's 3 groups *Microporeuta*, *Cladoporeuta*, and *Orthoporeuta* are natural (*Aporeuta*, founded on *Proscymum*, proves to be only a transitional form of *Olynthus*). Häckel renames these groups:—(1) ASCONES. Gastric wall very simply permeated by inconstant dermal pores. Corresponds on the whole to the *Grantiæ* of Lieberkühn, or the *Leucosoleniæ*, Bowerb. Types, *Grantia* (*Leucosolenia*) *botryoides* and *G. coriacea*: nearest the *Hydroida*. (2) LEUCONES. Gastric wall very irregularly permeated by tortuous and ramifying vessels (= *Grantiæ*, Schmidt; *Leuconia*, Bowerb.; including the *Leucogypsia*). Types *Grantia* (*Leuconia*) *nivea* and *G. solida*.

(3) **SYCONES**. Gastric wall very regularly permeated by straight and unramified canals (= *Grantiæ*, Bowerb.; *Sycones*, Lieberk.). Types *Grantia* (*Sycon*) *ciliata* and *G. compressa*: nearest the corals. It is plain that the *Ascones* form the main stem of the calcareous sponges, from which the other two groups diverge in opposite directions. The older systems of classification were not based on the spicules, which are relatively so constant in form and arrangement as to be of the first importance in the determination of genera and species. There are only 3 different forms of spicules in calcareous sponges—(1) simple needles, (2) 3-rayed needles, (3) 4-rayed needles, each of which builds up the skeleton alone or in combination. The 2-rayed needles, which he formerly thought to form another group, are only a subordinate condition of the first. Only 7 forms of skeleton are therefore possible, all of which exist in nature; and Hæckel consequently divides the calcareous sponges into 21 genera, to which he applies wholly new names, because his genera do not correspond to those of his predecessors [a most reprehensible proceeding, in the face of the confusion which exists already in all branches of natural history, in consequence of the unconscious or wilful disregard of the law of priority by various authors], and adds the following table:—

Skeleton-structure.	ASCONES.	LEUCONES.	SYCONES.
Spicula all simple	Ascyssa.	Leucyssa.	Sycyssa.
Spicula 3-rayed	Ascetta.	Leucetta.	Sycetta.
Spicula 4-rayed	Ascilla.	Leucilla.	Sycilla.
Spicula simple and 3-rayed	Ascortis.	Leucortis.	Sycortis.
Spicula simple and 4-rayed	Asculmis.	Leuculmis.	Syculmis.
Spicula 3- and 4-rayed	Ascaltis.	Leucaltis.	Sycaltis.
Spicula simple, 3- and 4-rayed..	Ascandra.	Leucandra.	Sycandra.

K. JÁNOS notices Hæckel's views respecting the affinities of the Sponges with the *Cælenterata*, Term. Közl. 1871, p. 147.

E. EHLERS (Z. wiss. Zool. xxi. pp. 540-567) proposes to call the sponges without pores *Spongiæ holosarcinæ*, and the others *Spongiæ cælosarcinæ*. The chief points of importance in the classification of the sponges are the arrangement and extent of their porous system, and the differences in the sponge-body itself. The lowest form of the *Cælosarcinæ* is *Cellulophuna pileata*, Schmidt; and the next *Veluspa polymorpha*, Mikl.-Macl. The large cavity arising from a development of a section of the cœlenteric spaces may be called a *megacælon*, and its opening a *megastoma*; but the cavity arising by regular division of the whole sponge-body he calls a *cæloma*, and its opening a *cælostoma*. There is but little affinity between the Sponges and *Cælenterata*, although the cœnostoma and cæloma of a sponge appear to be homologous to the mouth and body-cavity of the *Cælenterata*, and the pores of the epidermis of the latter to the

openings of the cœlenteric cavities of the sponge-body. The *Holosarcinæ* correspond to O. Schmidt's hypothetical group of *Protospongiæ*; but the difference in the structure of the sponge-body is not sufficient to separate Schmidt's *Halisarcinæ*, *Gummineæ*, and *Ceraospongiæ* from the siliceous sponges. Ehlers lays most stress on whether the texture of the sponge is capable of secreting spicules or not. He would introduce a section *Alithospongiæ* in the *Protospongiæ*, making the *Stromatopores* a separate group in it, called *Ptychospongiæ*, and characterized by their lamellated structure. The *Myxospongiæ* and *Ceraospongiæ* will also be placed here, though exhibiting a somewhat higher phase of structure. He thinks Hæckel is wrong in making these latter groups into widely distinct sections as *Silicispongiæ* and *Calcispongiæ*. Remarks on the position of various sponges, and on the structure of the calcareous sponges, conclude the paper.

H. J. CARTER, "On two undescribed [marine] Sponges and two *Esperiadæ* from the West Indies; also on the Nomenclature of the Calcisponge *Clathrina*, Gray," Ann. N. H. (4) vii. pp. 268-283, pl. 17, redescribes and figures *Ectyon sparsus*, Gray (= *Chalinopsis clathrodes*, Schmidt), and *Acarnus innominatus*, Gray. He proposes the following primary division of the *Spongiadæ*:—(1) The rigidity of the skeleton dependent on a predominance of the sarcodal over the siliceous element: commencing with *Verongia*, Bowerb., in which there is nothing but horny fibre. (2) The rigidity of the skeleton dependent on a predominance of the siliceous over the sarcodal element: *ex. gr.* *Dactylocalyx puniceus*, Stutchbury, in which the horny fibre is silicified. (3) The rigidity of the skeleton dependent on a predominance of the spiculous over the sarcodal element: *ex. gr.* *Acarnus innominatus*, in which the sarcodal element is reduced to a minimum; *Hyalonema*, &c.; also the *Calcispongiæ*. This division cannot, however, be maintained if the presence of the tricurvate or bow-like spicule is made supreme. *Spongia* (*Grantia*) *coriacea*, Montagu & Johnston, = *G. clathrus*, Schmidt, = *Clathrina sulphurea*, Gray, is also noticed. The colour of a sponge may sometimes be due to the presence of a parasite, as in a specimen of *Halichondria incrustans*, the tips of the surface of which are a beautiful carmine-red, owing to an algal (?) parasite.

PERTY remarks popularly on the classification of the sponges, Mitth. Ges. Bern, 1870, pp. xix-xxv.

H. JAMES-CLARK considers that the close relationship between the *Infusoria Flagellata* and the *Spongiæ Ciliatæ* is proved by the discovery of the intermediate *Phalansterium*, Cienk. Am. J. Sc. (3) i. pp. 113, 114, ii. pp. 426-436; Ann. N. H. (4) vii. pp. 247, 248.

II. J. CARTER (Ann. N. H. (4) viii. pp. 1-27, and plates 1 & 2, represent-

ing many species of sponges, &c), while confirming James-Clark's important observations (*cf.* Zool. Rec. iii. pp. 637, 644, v. pp. 576, 577) from observations of his own on *Grantia compressa*, &c., is unable to discover sponge-cells in siliceous sponges (except *Spongilla*), owing to their smaller size. The sponge-cell (whose true mode of feeding is still somewhat doubtful) is at one time a flagellated infusorium, and at another a rhizopod, and is therefore intermediate between the two. He also describes and figures (pl. 2. f. 33-37) the structure of *Cliona corallinoides*, Hancock, and figures a group of *Botryllus polycychus* (pl. 2. f. 41), pointing out the analogy between them and the sponges. He regards the osculum of the sponge as a vent, as it only serves accidentally for an influx of water, and not normally, as supposed by Hæckel, whose views on the structure and classification of the sponges he criticizes.

H. J. CARTER remarks on the parasites of the sponges, and severely criticizes Bowerbank, whose *Stematumenia* is an *Alga*, and his *Halyphysema* a *Foraminifer*. Ann. N. H. (4) viii. pp. 330-332.

E. PARFITT (Tr. Devon. Ass. 1870; *cf.* Q. J. Sc. n. s. i. p. 113) describes and figures 27 different sponge-spicules from the greensand of Haldon and Blacktown, near Exeter. Many of them are identical with those of recent species described by Bowerbank in his 'British Spongiadæ'; and others closely resemble those of *Euplectella aspergillum* and *Pheronema (Holtenia)*.

M. PONTON ('The Beginning, its When and its How,' pl. M) figures various sponge-spicules.

Carpenter and Wyville Thomson's researches on sponges are noticed, Arch. Sci. Nat. xli. pp. 81-83.

CALCAREA.

Sycon ciliatum. On its embryo, *cf.* Willemoes-Suhm, Z. wiss. Zool. xxi. p. 382, pl. 31. f. 4.

Trichogypisia, g. n., Carter, Ann. N. H. (4) viii. p. 1. Massive, sessile, depressed. Surface uneven, rough, ridged, villous, presenting a single vent at one end of the ellipse, about midway between the border and the centre, at the bottom of an oval excavation, furnished internally with a circle of minor vents arranged round the large one. Spores scattered over the surface generally. Internal structure close, areolar, accompanied by the branching excretory canal-system. Spicules of one form only (no triradiate or quadri-radiate spicules), linear, sinuous, fusiform, spino-tuberculate at the extremities, arranged more or less perpendicularly. Type *T. villosa*, sp. n., *id. l. c.* pl. 1. f. 1-4, on the deciduous capsule of a shark's egg, S. Devon.

Leuconia johnstoni, sp. n., *id. l. c.* p. 3, pl. 1. f. 5-12, coast of Devon (= *L. nivea*, var., Johnst.).

SILICEA.

H. J. CARTER, "A Descriptive Account of three Pachytragous Sponges growing on the rocks of the South Coast of Devon," Ann. N. H. (4) vii. pp. 1-15, pl. 4, proposes the term *Pachytragia* to include the *Corticatæ* of O. Schmidt and the *Tethyadæ* and *Sphaerospongia* of Gray. The chondroid species, of which *Tethya lyncurium* is typical, with its repent or incrusting allies,

should, perhaps, be grouped together with Schmidt's *Chondrilla nucula*, &c.; but the term *Sphaerospongia* should be suppressed. The spheroidal form is merely accidental in free specimens of *Pachymatisma johnstonium* and *Tethya arabica*; and the fixed form is always encrusting, horizontal, and undulating. Their mode of growth is then fully described. The only true instance of a spheroidal sponge is seen in some specimens of *Tethya* (*Donatia*) *lyncurium* and others, which grow on a pedicel. The habit of the species is then described, as the writer's former figures and descriptions are inaccurate, having been made from dead specimens only. Two of the new species described, viz. *Dercitus niger* and *Stelletta aspera*, possess a number of peculiar cells, similar to those of the *Geodidae*, which appear to be reproductive agents (cf. M. Micr. J. v. pp. 185 & 186).

Tethyidae. H. J. Carter reviews the confused synonymy of the group, and agrees with Gray in retaining *Tethya*, Risso (= *Tetilla*, Schmidt), for *T. cranium* and allies, and *Donatia*, Nardo, for *T. lyncurium* and allies. Ann. N. H. (4) viii. pp. 103-105.

H. J. CARTER (l. c. vii. pp. 112-141, pls. 7-10) compares the fossil sponge-spicules of the greensand, which belonged almost exclusively to the *Coralliospongiae* (including the *Euplectellidae*) and the *Pachytragia*, with those of existing species. Carter suggests that the stem of *Hyalonema* may be the same as the beard of *Holtentia*, modified by the presence of a parasite. Parasitic polypi occur on other halichondroid sponges besides *Hyalonema*. *Stelletta* (*Tisiphonia*) *agariciformis* (= *Wyvillethomsonia wallichi*, Wright) ? = *Tethya muricata*, Bowerb., according to J. E. Gray. The deep-sea sponges and *Coralliospongiae* occasionally mingle, and *Stelletta agariciformis* occurs both at 178 and 1913 fathoms.

Dorvillia agariciformis, Kent, ? = *Tisiphonia agariciformis*, Wyv.-Thoms. MS.; and *Wyvillethomsonia wallichi* is probably its young form. None of the sexradiate forms, in addition to figs. 12 & 14, Kent, M. Micr. J. iv. pl. 66, are referable to *Dorvillia*, but have simply become entangled with the specimen by contact with examples of other species. Kent, Ann. N. H. (4) vii. pp. 37 & 38.

Dorvillia agariciformis figured by A. Cubitt, M. Micr. J. v. pl. 82, upper figs.

Euplectella aspergillum described and figured by N. Funck, Pub. Inst. Luxemb. x. pp. 266 & 267, plate.

Euplectella speciosa figured by M. Ponton, 'The Beginning, its When and its How,' pl. N.

Hyalonema sieboldi and *Euplectella aspergillum*, cf. E. Grube, JB. schles. Ges. xlvii. pp. 45-48.

Ianthella, Gray. W. Fleming (Verh. Ges. Würz. n. s. ii. pp. 1-7, pl. 1) describes the structure of *I. basta* and *I. flabelliformis* very fully, and figures the former. (*Spongia basta*, Esp., does not belong to this genus at all.) The position of the genus *Ianthella* is quite uncertain. Abstract, Z. ges. Naturw. (2) iv. pp. 206 & 207.

Caulospongia, n. g. W. S. Kent, P. Z. S. 1871, p. 616. Sponge consisting

of a central stem or axis, around the distal portion of which the sponge-body is disposed in separate whorls, or in more or less regular spiral convolutions. Skeleton compound, consisting of a primary network of ceratose fibre, with siliceous spicula irregularly imbedded in it, and an accessory one of siliceous spicula only. Spicula of one form, simple, spinulate, arcuate. Allied to *Diplodemia*, Bowerb. Types *C. verticillata*, N. Australia, and *C. plicata*, hab. —P., spp. nn., *id. l. c.* pl. 48. figs. 1 & 2.

Aulorhipis elegans, n. g. & sp., Ehlers, SB. Soc. Erlang. 1871, iii.; Ann. N. H. (4) vii. pp. 302 & 303; Z. wiss. Zool. xxi. pp. 540–567, pl. 42. Sponge lining the inner surface of a worm-tube, projecting from its superior opening in the form of a small stem, which forks into two branches bending downwards in the same plane, each of which gives off 8 or 10 twigs directed upwards, standing at regular distances apart, one or two of which give off lateral branchlets, springing at an acute angle in the same plane, also directed upwards, and terminating in a capillary form. No pores, oscula, or internal canal-system. Bass's Straits and Narson Island (= *Terebella flabellum*, Baird, P. L. S. viii. p. 157, pl. 5. fig. 1). Allied to the *Ceraospongia*, especially to the fossil genus *Stromatopora*, and is a unique form among living sponges.

New species :—

Tethya casula, Carter, Ann. N. H. (4) viii. p. 99, pl. 4, S.-African coast.

Dercitus niger, *id. l. c.* vii. p. 3, pl. 4. figs. 1–6, Devon (? = *Hymeniacion bucklandi*, Bowerb., var.).

Stelletta aspera, p. 7, pl. 4. figs. 7–14, *lactea*, p. 9, pl. 4. figs. 15–22, Devon : *id. l. c.*

Spongilla (?) *arachnoidea*, H. James-Clark, Am. J. Sc. (3) ii. p. 427, pl. 2, Massachusetts.

Esperia socialis, Carter, *l. c.* p. 276, West Indies.

Ianthella verrucosa, Giebel, Z. ges. Naturw. (2) iv. p. 380, Indian Ocean ? or New Holland ?

GREGARINIDA.

VAN BENEDEN ("Recherches sur l'évolution des Grégarines," Bull. Ac. Belg. xxxi. pp. 325–359, plate; transl. Q. J. Micr. Sci. xi. pp. 242–260, pl. 12, and noticed, M. Micr. J. vi. pp. 104 & 105) describes the development of *Gregarina gigantea*, which occurs in the small intestines of the lobster. The earliest stage of the germs resembles *Protamæba*, Häck.; but subsequently the protoplasmic mass shows a tendency to separate into a cortical and a medullary substance. Others exhibit one or two prolongations resembling pseudopodia, but which, from their constant form and the nature of their movements, have really more affinity to the mobile appendage of the *Noctiluca*. When one of these prolongations has attained a certain length, it detaches itself; and the other then becomes developed in its turn. The latter does not detach itself from the cytode, but develops by gradually absorbing the body of the cytode, as the embryo of a vertebrate animal absorbs the contents of the vitelline vesicle.

The developed protoplasmic filaments execute rapid undulatory movements in the intestine, similar to those of the Nematoid worms. (It is probably similar pseudofilaria of the Gregarinæ of the earthworm which have been taken for young Nematoids.) The pseudofilarium subsequently ceases its movements, and develops a nucleolus by a process somewhat analogous to crystallization. The pseudofilarium continues to shorten; the layer of the nucleus becomes more sharply defined; transparent zones form round the nucleolus; and we thus have a perfect young *Gregarina*, which soon acquires the size and characters of the adult. The successive disappearance of the nucleoli is only to be observed in the adult; in the young, the nucleus never encloses more than one large nucleolus, which generally contains a small vacuole. Van Beneden proposes the word *plussion* to designate the substance of cytodes, and would restrict the term *protoplasm* to the substance of the body of a cell. The above observations are specially interesting, from the nucleolus and nucleus being developed on the cytode by endogenous formation. The course of development in the *Gregarinidæ* is as follows:—(1) Monera stage, (2) Generative cytode stage, (3) Pseudofilarium stage, (4) Protoplast stage, (5) Encysted Gregarine stage, (6) Psorosperm stage. True conjugation does not appear to occur in these organisms; and their sometimes becoming attached is probably only an accidental phenomenon, analogous to the fusion of amœboid particles to form a plasmodium.

A. STUART has observed traces of a special digestive canal in *Gregarinæ*, Nachr. Ges. Götting. 1870, p. 102.

Zygocystis pterotracheæ, body-cavity of *Pterotrachea*, and *Monocystis telepsavi*, intestinal appendages of *Telepsavus castorum*, Odessa, spp. nn. Structure &c. described by A. Stuart, Bull. Pétersb. xv. pp. 497–502, plate.

INFUSORIA.

GIEBEL very briefly notices the progress of knowledge on the Infusoria, Z. ges. Naturw. (2) iv. pp. 384 & 385.

Euglena and *Phacus*. Their various forms noticed by J. Barker & W. Archer, Q. J. Micr. Sci. xi. pp. 98 & 99. *Phacus longicauda*, *triquetra*, and *pleuronectes* are probably specifically identical, as are also *E. geniculata* and *spirogyra*, and possibly *P. tripteris*: Archer, *l. c.*

Syncrypta volvox, Ehrenb. On its various stages, cf. W. Archer, *l. c.* pp. 316–318. He has observed it in a seemingly encysted condition.

Aporea ambigua, Bailey. Archer (*l. c.* pp. 208–210) describes the “monads” whose direct evolution and swimming away from the summits of the branches he has observed. They appear to be closely allied to *Monas consociata*, Fres., recently placed by Cienkowski in his genus *Phalansterium* (probably=*Aporea*, Bailey, which has the priority), along with a second species, *P. intestinum*, Cuk., only doubtfully distinct from the first.

Peridinium. On the development of a species found in the Bay of Kiel, cf. Willemoes-Suhm, Z. wiss. Zool. xxi. pp. 380-382, pl. 31. figs. 1-3.

Vorticella. R. Greeff gives a most exhaustive account of the structure, reproduction, &c. of several species. Arch. f. Nat. xxv. p. 584 *et seq.*, xxxvii. pp. 185-221, pls. 4-8; Z. ges. Naturw. (2) iv. pp. 356-358 (abstract). The paper was previously published in Verh. Ver. Rheinl. xxvii. in abstract; and the principal points are noticed in Zool. Rec. vii. pp. 509 & 510.

Carchesium polypinum. On the front side of the body, close to the contractile vesicle, is a bladder-like, non-contractile cavity, the entire inner surface of which is covered with slender straight processes, arranged in a tangential position towards the upper surface. R. Greeff, SB. Ver. Rheinl. xxviii. p. 8.

Noctiluca miliaris. Cienkowski describes the mode of copulation and the swarm-spores in this species. Arch. mikr. Anat. vii. pp. 131-139, pls. 14 & 15; Q. J. Micr. Sci. xi. pp. 305-308 (abstract).

Undulina, g. n., E. Ray Lankester (Q. J. Micr. Sci. xi. pp. 387-389), will form the type of a new group, devoid of mouth (as in *Opalina*) and cilia, but provided with a broad crust-like undulating membrane. Type *U. ranarum*, sp. n., *id. l. c.*, woodcuts, parasitic in blood of *Rana esculenta*, Leipzig.

Ceratium cumaonense, sp. n., Carter (= *C. fusca*, Ehrenb., var. ?), Ann. N. H. (4) vii. pp. 229 & 230. Found in all the lakes of Kumaon, at an elevation of 4000 to 6500 feet, sometimes in such numbers as to change the colour of the water to a rusty brown. They mostly occur near the surface, seldom at a greater depth than 20 feet, and are perfectly visible to the naked eye. (Not fully characterized, for want of recent specimens.)

Lagenella urceolaris, sp. n., Schmarda, Zoologie, i. p. 187, hab. — ?

RHIZOPODA.

Under the title of 'Biologische Studien,' i., 'Studien über Moneren und andere Protisten' (Jena: 1870, 8vo, 6 plates), E. Haeckel has reprinted his papers on *Monera*, published in Jen. Z. Nat., and previously noticed in Zool. Rec. For an analytical review, cf. Q. J. Micr. Sci. xi. pp. 60-68, pl. 5.

On Haeckel's 'kingdom' *Protista*, cf. K. János (Term. Közl. 1871, pp. 146 & 147), who adds a list of the principal divisions, according to Haeckel's latest sketch in the 'Biologische Studien.'

G. W. Dawson's paper on *Foraminifera* from the Gulf and River St. Lawrence is reprinted from Canad. Nat. June 1870, in Am. J. Sc. (3) i. pp. 204-210, and Ann. N. H. (4) vii. pp. 83-90, with woodcuts (cf. Zool. Rec. vii. pp. 513, 517).

W. ARCHER's paper "On some Freshwater Rhizopoda, new or little known," ii. (cf. Zool. Rec. vii. p. 512), is reprinted, Q. J. Micr. Sci. xi. pp. 107-151, pls. 6 & 7, from P. R. Irish Ac. (2) i. pp. 67-104, pls. 12 & 13.

W. DONITZ ("Beobachtungen über Radiolarien," Arch. Anat. Phys. 1871, pp. 71-82, pl. 2) describes and figures some of the earlier stages and details of *Collozoum inermis*, *Thalassicolla pelagica*, *Collosphæra huxleyi*, &c.

L. CIENKOWSKI describes and figures the formation of zoospores in *Collosphæra huxleyi*, *C. spinosa*, and *Collozoum inermis*. Arch. mikr. Anat. vii. pp. 372-381, pl. 29; transl. Q. J. Micr. Sci. xi. pp. 396-403, pl. 18.

Collozoum inerme. On its non-sexual reproduction, cf. A. Stuart, Nachr. Ges. Götting. 1870, pp. 100 & 101.

A. SCHNEIDER publishes observations on *Acanthocystis viridis*, *Actinophrys eichhorni*, and *Diffugia*. The genera *Acanthocystis* and *Aulacantha* appear to be very closely allied, if not identical. *Diffugia proteiformis, oblonga*, and *acuminata*, Ehrenb., and the other large species, belong to the *Radiolaria*; and *D. enchelys*, Schn., nec Ehrenb., should either be referred to *Arcella* or to a new genus. "Zur Kenntniss der Radiolarien," Z. wiss. Zool. xxi. pp. 505-512, woodcuts; cf. Z. ges. Naturw. (2) iv. pp. 338-340.

R. GREEFF, SB. Ver. Rheinl. xxviii. pp. 4-8, refers *Actinophrys sol*, *A. eichhorni*, and *Acanthocystis viridis* to the *Radiolaria*, fam. *Acanthometridæ*. *A. eichhorni* consists of 4 layers:—(1) the external layer of pseudopodia (which, however, are not true pseudopodia, as they originate in the interior of the body); (2) close alveolar layer; (3) homogeneous vesicular zone; (4) nucleated central substance. *A. eichhorni* reproduces itself non-sexually by fission, dividing into two halves, sometimes of nearly equal size, and sometimes differing in size. An individual disturbed in the act of division will often contract itself again into one animal, a process which has been mistaken for conjugation. It is probable that the internal substance sometimes develops embryos in the form of amœbæ, as Greeff has seen amœbæ which subsequently developed a flagellum issue from the body of a large dead *A. eichhorni*. *Actinophrys sol* also reproduces by fission; and the two halves often remain connected for a time, but never reunite again into one. This, again, is not true conjugation.

Actinosphærium eichhorni. On a very remarkable form somewhat resembling this species, cf. W. Archer, Q. J. Micr. Sci. xi. pp. 101-104.

J. D. MACDONALD, Ann. N. H. (4) viii. pp. 224-226, has observed 6 genera of *Diatomaceæ* and 6 of *Polycystina* in a bottle of deep-sea soundings obtained by Staff-Capt. Calver, of H.M.S. 'Porcupine,' in lat. 47° 35' N., long. 12° 15' W.; depth 2435 fathoms, or 3 statute miles. He has never seen any evidence of the existence of pseudopodia in genuine *Foraminifera*; and perfect fixity has been the rule, either by a broad base or a pedicle. He remarks on the sarcode of the various forms, the mode of deposition of their shells, and their affinities. Many of the free *Polycystina* (?) taken in the towing-net, such as *Distyocha*, should be referred to the *Thalassicolliidæ*. He suggests the following arrangement of the

POLYCYSTINA.

Rhizopoda furnished with a siliceous spicular or fenestrated framework.

Growth of sarcode	{	Simple or continuous . . .	{	<i>Acanthometra</i> .
		By concentric accessions		<i>Eucyrtidium</i> .
				<i>Stylodictya</i> .
				<i>Astromma</i> .

M. PONTON ('The Beginning, its When and its How') figures many forms of *Foraminifera* (pl. A), *Polycystina* (pls. B-F), and spikes of ditto (pl. G).

W. K. PARKER, T. R. JONES, and H. B. BRADY, "On the Nomenclature of the *Foraminifera*," Ann. N. H. (4) viii. pp. 145-179, 238-266, pls. 8-12, review 158 recent and fossil species founded by D'Orbigny, in Ann. Sc. Nat. 1826, vol. vii., on the figures in Soldani's 'Testaceographia ac Zoophyto-

graphia' (all of which are reproduced), as well as various other species subsequently established by D'Orbigny. The paper is preceded by a bibliographical notice of Soldani's work. No abstract of the special part of the paper can here be given. There are still 253 species enumerated in D'Orbigny's Tableau, which must lapse for want of any description or reference to identify them.

Pamphagus mutabilis, Bailey. This N.-American species has been detected in Westmeath and Tipperary. It has a large elliptic so-called "nucleus," like that of *Amœba*, though it is more nearly related to *Plagiophrys*. W. Archer, Q. J. Micr. Sci. xi. p. 101.

Arcella. The species have the power of secreting bubbles of gas, which enable them to rise to the surface of the water. When the supply is exhausted, they sink. T. W. Engelmann, Arch. Néerl. iv. pp. 427-430, pl. 7.

Amœba diffluens and *Arcella vulgaris*. The effect produced on their form and motions by slight electric discharges is described: *id. l. c.* pp. 431-442.

Amœba terricola, Greeff. On this species, *cf.* J. Gagliardi, Q. J. Micr. Sci. xi. pp. 80-85. He adds that *A. flava*, Greeff, probably = *Corycia duyardini*; and *A. brevipes*, Greeff, is probably an incomplete stage of *Amphizonella digitata*.

On the gradual development of *Amœbæ* in a solution of white of egg, *cf.* G. B. Crivelli and L. Maggi, Rend. Ist. Lomb. (2) iii. pp. 367-375, plate.

O. SCHMIDT ("Ueber Coccolithen und Rhabdolithen," SB. Ak. Wien, lxii. pp. 669-682, pls. 1 & 2) considers that the discoliths and cyatholiths of Hæckel and Huxley are simply forms of the same organism, the coccolith, but that these organisms are independent of *Bathybius*. He describes and figures various stages, as well as of a much more simple organism from the Adriatic, which he calls *Rhabdolithes*, and considers to be also an independent organism. At first it presents the appearance of a short stick, but afterwards develops a knob of very variable form at one end.

On fossil coccoliths and *Orbulinæ* in the Upper Westphalian limestone, with remarks on *Bathybius* &c., *cf.* Von der Marck, SB. Ver. Rheinl. xxviii. pp. 60-62.

The recent observations of Thomson, Huxley, Hæckel, and others on Coccoliths, *Bathybius*, *Myxobrachia*, &c. are noticed, Arch. Sci. Nat. xli. pp. 76-78.

Huxley's observations on coccoliths noticed by K. János, Term. Közl. 1869, pp. 42 & 43.

Sphærozoum sanderi, sp. n., Donitz, Arch. Anat. Phys. 1871, p. 76, pl. 2, Naples.

Astromma yelvertoni, sp. n., J. D. Macdonald, Ann. N. H. (4) viii. p. 226, figs. 1 & 2. Lat. 47° 35' N., long. 12° 15' W.; 2435 fathoms.

INDEX TO

GENERA AND SUBGENERA DESCRIBED AS NEW :

INCLUDING NAMES PROPOSED FOR GENERA ALREADY
CHARACTERIZED.

[The symbol || indicates that the name to which it is affixed has been used before in zoology.]

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